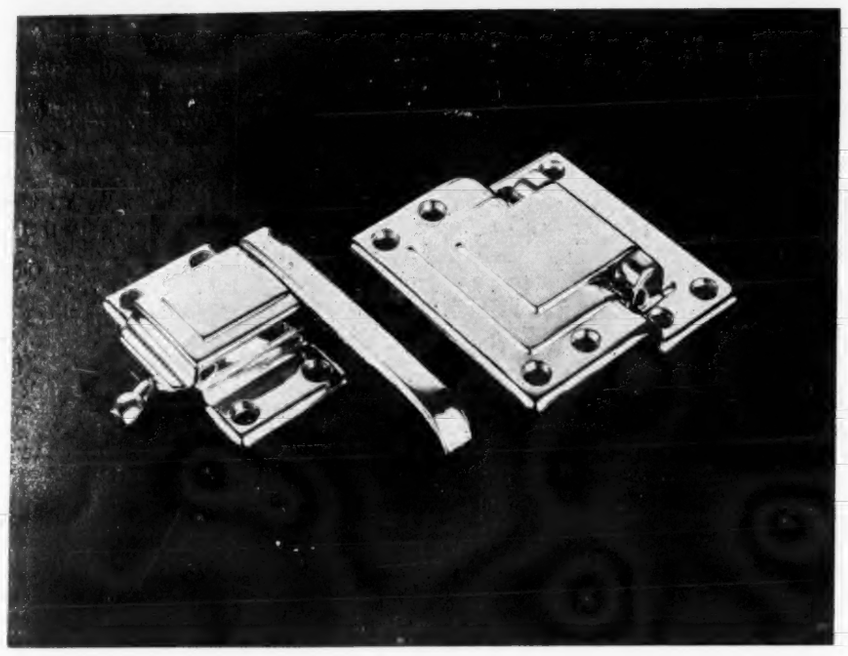
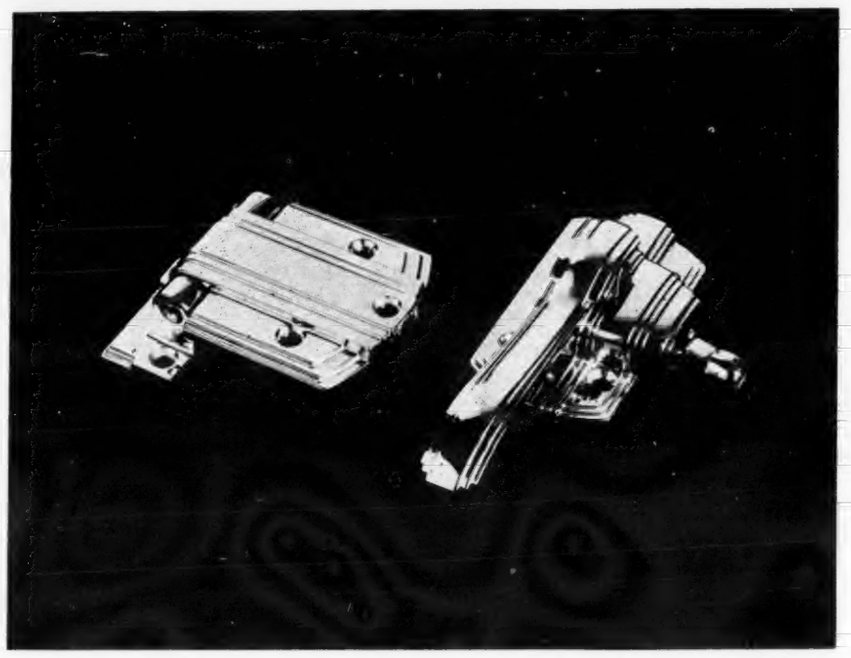




The Dura Company most cordially invite their friends and customers to view the Third Exhibition of Contemporary Industrial Art sponsored by the American Federation of Arts. This Exhibition embraces the outstanding examples of Decorative Metal Work and Cotton Textiles. An enviable number of Dura products have been selected by the Committee including the examples of refrigerator hardware shown at the top of this page.

On View

The Museum of Fine Arts, Boston
October 15th to November 10th, 1930

The Metropolitan Museum of Art, New York
December 1st to December 28th, 1930

The Art Institute of Chicago, Chicago
January 19th to February 15th, 1931

The Cleveland Museum of Art, Cleveland
March 11th to April 5th, 1931

DURA

THE DURA COMPANY
TOLEDO, OHIO

In Three Parts—Part 1

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, NO. 5, SERIAL NO. 107

DETROIT, MICHIGAN, NOVEMBER 5, 1930

Entered as second class matter Aug. 1, 1927, at Detroit, Mich.

FIFTEEN CENTS PER COPY
TWO DOLLARS PER YEAR

Carrier Companies Join In Refrigeration Merger

Brunswick-Kroeschell and York Also Involved in Consolidation of Interests

Newark, N. J.—Merger of the Carrier Engineering Corporation of Newark, N. J., the Brunswick-Kroeschell Company of New Brunswick, N. J., and Chicago, and the York Heating and Ventilating Corporation of Philadelphia, each one of the largest concerns, respectively, in the air conditioning, refrigerating, and unit heating and ventilating industries, has just been announced. Including subsidiary and affiliated concerns, the merger will unite fifteen companies, five of them foreign, with total assets of approximately $15,000,000.

"The consolidation will provide a single world-wide organization equipped to provide any desired kind of indoor atmospheric conditions in homes, hotels and apartment houses, stores, theatres, office buildings and industrial plants," J. I. Lyle, executive vice-president of the Carrier Corporation, stated in making the announcement.

"Air conditioning and refrigeration have been two of the fastest growing industries in the country, and heating and ventilating has entered a new and expanding phase. Each of the three companies has had its own specialized field, but their respective research, engineering, manufacturing, sales and service facilities supplement one another. The merger plan contemplates that the fifteen companies involved will retain separate entities under a holding company to be known as the Carrier Corporation, which will conduct all research and will direct sales and engineering activities for the group."

The Carrier Engineering Corporation was founded in 1914 by Willis H. Carrier, J. I. Lyle, E. T. Murphy, and five associates who had worked with them in the Buffalo Forge Company. Mr. Carrier, who is president of the company,

(Concluded on Page 8, Column 2)

Low Temperature

THE Low Temperature meeting of the Detroit section of the American Society of Refrigerating Engineers on Nov. 3rd, is reported in the Refrigerated Food section of this issue of the News. It begins on the first page.

Standardized production as the next big step in the development of suitable cases for handling quick-frozen foods in the retail store was indicated by the general trend of the ten-minute speeches at the meeting. Although several of the problems still to be solved were discussed by various speakers, the whole meeting was permeated with an atmosphere of firm confidence in the future of quick-frozen foods, products that less than a year ago were generally regarded as almost fantastic.

Standard Safety Code Wins Final Approval

A. S. A. Committee At Last Accepts Refrigeration Regulations Sponsored By A. S. R. E.

New York, N. Y.—The long struggle for a standard refrigeration safety code that can be recommended to American municipalities, with the assurance that it is backed by all branches of the industry, has come to an end. The American Standards Association announced on October 29th that the Safety Code for Mechanical Refrigeration, sponsored by the American Society of Refrigerating Engineers, had at last been approved.

The gradual development of this code has been traced in the pages of ELECTRIC REFRIGERATION NEWS for the last two or three years. The text of the code as it went to the American Standards Association was printed in the May 7th issue on pages 11, 12, 13, 14, 15, and one or two minor changes were printed in the August 13th issue, page 1. It is understood that one or two additional alterations have been made since that date. They are simply changes in numbering and the elimination of an incorrect reference to a previous section. In order that readers of ELECTRIC REFRIGERATION NEWS may have the code in complete form, it will be republished in the November 19th issue.

By approving of the code, the A. S. A. leaves the way open for a vigorous campaign to bring it to the attention of towns and cities all over the country which have been waiting for the adoption of a safety code which would not arouse opposition of one faction or another as soon as it was proposed, and one of the functions of the standard code is to meet this need.

Under the direction of Harry D. Edwards, president of the A. S. R. E., the steps toward approval of the code have been pushed vigorously during the last twelve months. The work of getting approval of the long list of organizations interested has been patiently undertaken, and last summer it looked as though final approval was only a few weeks away. Various delays came up, however, and it was not until a few days ago that the A. S. A. announced that its approval had been recorded.

A picture of the vast network of organizations which have passed on and

(Concluded on Page 8, Column 5)

Glorifying the Ice Cube

THE modernistic spirit which is so typical of the electric refrigeration industry is by no means confined to this country. The striking window display which appears above was designed by the Copeland representatives in Sao Paulo, Brazil. The ice cube is the dominating theme overshadowing the refrigerator itself which lurks discreetly in the background, so that the curious passerby may see the modest-looking machine which does the work.

The Portuguese legends on the ice cubes tell Copeland's sales story in the briefest possible fashion. The A. E. G. Campanhia Sul America de Electricidade is responsible for this thoroughly up-to-the-minute window display.

FOUR FULL DAYS PLANNED FOR A.S.R.E. CONVENTION

New York, N. Y.—Quick-frozen foods will occupy a prominent position on the technical program scheduled for the twenty-sixth annual convention of the American Society of Refrigerating Engineers, when it convenes at the New Yorker Hotel December 3rd to 6th. The opening session will be devoted entirely to the subject of refrigeration and food. The engineers are making plans to put the winter meeting over in great style. Reduced railroad fares will probably be obtainable by those attending the convention. Each session will be crowded with interesting papers concerning problems in the refrigeration industry.

At the closing session considerable time will be taken up with the discussion of various test codes. This session promises to be a very interesting one. Problems concerning insulation will be brought to the attention of the engineers also at this session.

The social angle is not being neglected and the committee in charge is outlining a calender of events capable of keeping the engineers and their wives on the go. Parties, plays and trips are being arranged for the wives of members. To cap the climax will be the dinner dance at which compressors, B. T. U.'s, etc., will be numbered among the missing.

The technical program is as follows:

WEDNESDAY—REFRIGERATION AND FOOD
- Low Temperature Refrigeration
- Ozone and Cold Storage
- Food Freezing
- Heat Properties of Foods

THURSDAY—REFRIGERATION APPLICATIONS
- Oil Refinery Refrigeration
- Frozen Brines
- Humidity of Cold Storage
- Carbon Dioxide Ice Production

FRIDAY—COMMERCIAL AND DOMESTIC MACHINERY
- The Intermittent Absorption Machine
- Patents on the Enclosed Motor Compressor
- Commercial Machine Test Code

SATURDAY—REFRIGERATORS
- Thermal Testing of Refrigerating Cabinets
- A. S. R. E. and New York Test Codes
- Protection of Refrigerator Insulation
- Heat Behavior of Refrigeration Walls

SERVEL'S LATEST UNIT CAN BE HANDLED EASILY

Evansville, Ind.—A brand new Servel unit, hermetically sealed and of a design radically different from previous Servel machines, will be offered to the public shortly. Production on this new machine, which is to be called the "Servel Hermetic," will get under way early this month.

The new unit is designed so that one man inexperienced may remove it from its cabinet by taking out six screws and sliding it out of the back of the box. It weighs just 115 pounds. No dealer service will be necessary. Three models (three, four, and five cubic feet) will be offered, at prices less than $200.

Using 15 ounces of methyl chloride for a refrigerant, the unit has a radiator type condenser, which is cooled, not by a fan, but by a draft of air coming up from the floor through a flue at the back of the box. The condenser is raised six inches from the floor to take advantage of this draft.

A one-eighth horsepower motor of special design, split phase, induction type, is equipped with an external starting switch. Direct drive, positive force feed lubrication, and a selective thermostatic control are important factors in the new machine.

The control incorporates an overload relay and a starting switch, which allow the motor to start without a load and run until it has worked up full speed before it is put to work. Thus the necessity of an oil heating element is eliminated.

All valves are sealed within the "Derby Hat" dome, which is entirely under low pressure. The expansion valve is replaced by a simple coil. Welded steel

(Concluded on Page 4, Column 3)

ELECTROLUX-LONDON GETS 700 UNIT ORDER

London, England—An order for 500 two-hole and 200 four-hole ice cream cabinets was recently obtained by Electrolux, Ltd., 153-155 Regent Street, London, from the firm of Messrs. Lyons, Ltd. This is the second large order closed by Electrolux-London with Messrs. Lyons. During 1928, this company ordered 500 cabinets from Electrolux.

THE PINK OF PRODUCTION

PRODUCTION and service tools constitute the theme of the Buyer's Guide or Pink Section, which is part of this issue of Electric Refrigeration News. By its very nature, production machinery, hidden away in the factory, rarely receives the notice that is its due. This Pink Section seeks to emphasize the great importance of these vital factors in the refrigeration industry.

KING KOLD REFRIGERATOR ON MARKET IN CHICAGO

Chicago, Ill.—King Kold electric refrigerators, produced and marketed by the Illinois Moulding Co., recently made their bow to the Chicago retail trade.

Four models, ranging in price from $149.50 to $189.50, delivered in the home, are being offered for distribution in the Chicago metropolitan area. National distribution will be undertaken within six months, according to Herman J. Molner, president of the company, and distributors are being lined up in several cities.

Illinois and Seeger cabinets, with three inches of Dry Zero or Celotex insulation, are being used at present. With the exception of the smallest one, all models have porcelain interiors, fused on Armco iron.

A five-stage "Thermo Cold" temperature control, defrosting tray, ice cube trays with capacities of 45 large cubes in the five-foot models and 30 cubes in the smaller jobs, and chromium plated hardware, with self-locking door, are included.

The unit employs sulphur dioxide as a refrigerant, is powered by a one-fifth horsepower Delco motor, has a Fedders condenser, and is mounted on rubber plugs. Compressors are made in the Illinois Moulding Co. factory, after a special design.

Established in 1894 to manufacture picture frames, mirrors, moulding, art novelties and the like, the Illinois Moulding Co. has accumulated a large group of factory buildings on their lots fronting the 2400 block of West 23rd Street, in Chicago.

One of these buildings, possessing six stories and having an area of 250,000 square feet, is now being converted into

(Concluded on Page 12, Column 4)

MAJESTIC REVISES PRICE ADDS $20 ON EACH UNIT

Chicago, Ill.—Majestic has raised its prices. When the new Grigsby-Grunow refrigerator was first placed on the market, it was announced that the five cubic feet box would sell for $175.00, and the seven cubic feet box for $195.00, both f. o. b. Chicago.

As soon as the cost of line production on these models was definitely determined, Majestic officials decided to raise the price twenty dollars on each model. The five cubic feet job is now listed at $195.00, and its larger stable-mate at $215.00, both f. o. b. Chicago.

Shipments are going out rapidly, and the new "mighty monarch of the Arctic" can be seen on display in the windows of thousands of Majestic dealers scattered over the country.

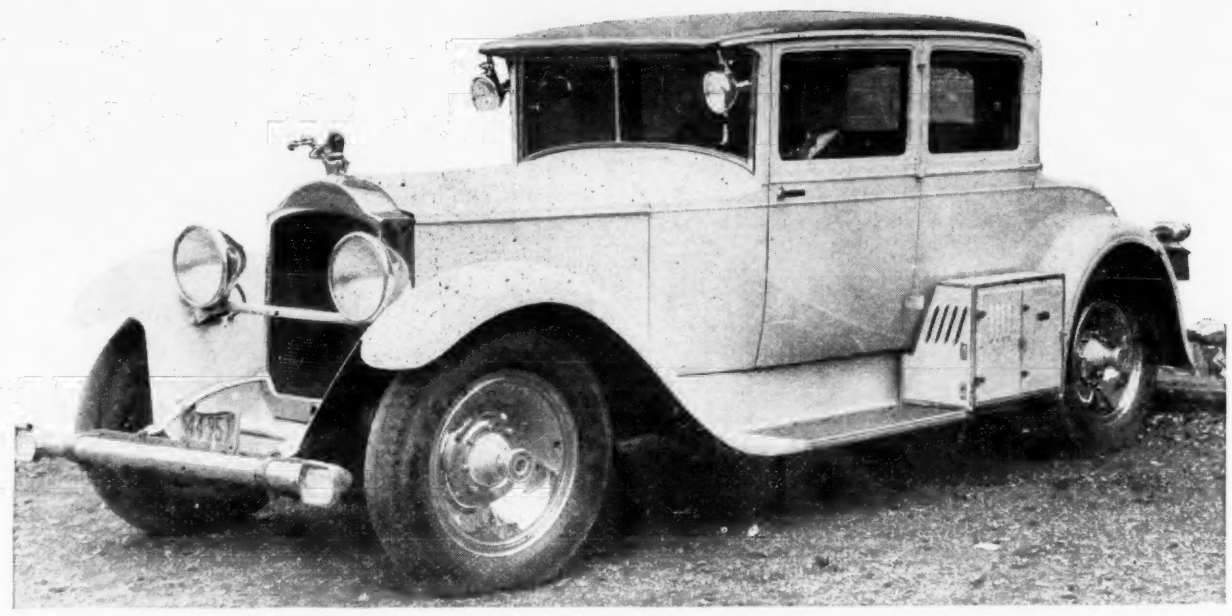
DETROIT MAJESTIC DEALERS PLAN ACTIVE CAMPAIGN

Detroit, Mich.—Harry Abrahamson, Detroit distributor for Majestic products, had a big party for his salesmen and dealers Oct. 22 at the Book-Cadillac Hotel here, and was greeted by a record turnout of his men. More than 200 were present.

The affair began with a full-course dinner served at luncheon time. After this meal there were speeches by Mr. Abrahamson, his brother, Ray, secretary and treasurer of the company, William Shirk, factory representative of the Grigsby-Grunow Co. in Michigan; Jack Shinberg, Mr. Abrahamson's service manager, and F. M. Cockrell, publisher of ELECTRIC REFRIGERATION NEWS.

The brothers Abrahamson welcomed the dealers, discussed company history and policy, and laid out plans for the coming season of radio selling. Mr. Shinberg explained the mechanical features of the new refrigerator in detail, and Mr. Cockrell analyzed the present economic situation with reference to the refrigeration dealer, and pointed out ways of taking advantage of the times.

The Midget Rides Along



The Sentinel of Food Safety Monopolizes a Small Portion of the Running Board.

Detroit, Mich. — Midget golf, midget automobiles, and now a midget electric refrigerator. The latest addition to the popular "midgets" is now on duty refrigerating the foods carried by Floyd M Williamson, Detroit engineer, on his 8,000 mile tour of the United States. Starting from Detroit last week, he expects to spend five or six months on the road.

The problem of keeping foods safe as encountered by Mr. Williamson on previous tours led to the birth of this Tom Thumb model. Months of hard effort finally crystallized into the finished product. Mr. Williamson, assisted by D. O. Dewey, built a small steel cabinet, 12 in. deep, 18 in. high, and 24 in. long, capable of being installed on the running board of a Packard coupe. The rear end of the refrigerator was designed so as to conform with the lines of the automobile body. The box was constructed of steel and insulated with corkboard. Finished in a lavender color, the unit, setting on the running board, matches the color scheme of the rest of the car. To top it off, chrome-plated trim and hardware were used.

With the completion of the cabinet, the big problem of selecting a unit to fit the compartment faced the pair. After attempting to utilize several types of compressors in the tiny compartment, they finally selected a small Absopure model. With this model they found that, although there wasn't much working room for adjusting valves, etc., it still enabled them a little spare room. Rigging up the compressor proved to be a big job, as many difficulties popped up.

Close quarters necessitated the installation of the condenser on the left side of the compartment. Set at a 90 deg. angle with the flywheel, it brought up the question about how to cool the condenser. A friction drive arrangement was set up in contact with the flywheel so that a small pulley and belt operate the condenser fan. To operate the compressor a six-volt, ⅛ horsepower motor has been hooked up on the running board. This motor is outside of the machine compartment. At the time the picture on this page was taken, the outside motor had been removed from the running board.

Next it was found that a quick-acting thermostat had to be installed on account of the short refrigerant line. A relay switch to handle the heavy current relieves the load on the hermostat. The first cooling unit installed in the cabinet was constructed by Mr. Williamson in his laboratory at 2486 Townsend Avenue, Detroit.

After several months' trial, the refrigerator was shown to officials of the Absopure Corporation. With their assistance, Mr. Williamson changed over the equipment by installing a 1930 model Absopure compressor. A new freezing unit was modeled after the direct expansion type used in present Absopure machines. It has two coils, one directly under the tiny ice cube tray provides fast freezing of cubes, while the other is of the fin type for cooling the food storage compartment which has nearly one cubic foot capacity. Tests of the machine indicate that the usual running time of the condensing unit is about three minutes, and the idle period of each cycle twelve to fifteen minutes.

To provide refrigeration at all times, Mr. Williamson installed an auxiliary motor in the machine compartment. In the event of a long lay-over at camp, the belting can be changed to the extra motor, which in turn can be hooked up to a regular 110-volt line. The refrigerator is portable and can be easily removed from the running board to an apartment or hotel room. The refrigerator can also be run off the battery while the car is idle.

An 18 ampere generator, in addition to the usual automobile equipment, was installed on the Packard to keep the special battery charged at all times. The generator has sufficient capacity to keep the battery up if the car is on the road three hours a day.

Woodward Avenue throngs were given a chance to look over the midget refrigerator. It was put on display in Kern's window and despite its size, proved to be a big interest to passers-by.

Refrigeration is not the only comfort of home that the lone tourist will enjoy. Long, monotonous trips can be made more interesting with the radio capable of picking up far-away stations. Camping equipment, etc., will be stowed away in the rear compartment of the coupe. According to present plans, he is driving south to Florida in his lavender and green coupe, where he will later follow the Gulf route to Texas and Lower California. He plans to take in all the sights along the Pacific Coast in the trip northward to Seattle and Portland. The long grind back to Detroit will be made via the northern route.

Mr. Williamson is not new to the refrigeration game. He spent some time with the Detroit Tool and Engineering Company when it manufactured the Economice electric refrigerator. Here he gained the experience which later came in very helpful when he decided to construct a Tom Thumb model for use on his motor car.

MAJESTIC NEW COMER AT PHILADELPHIA SHOW

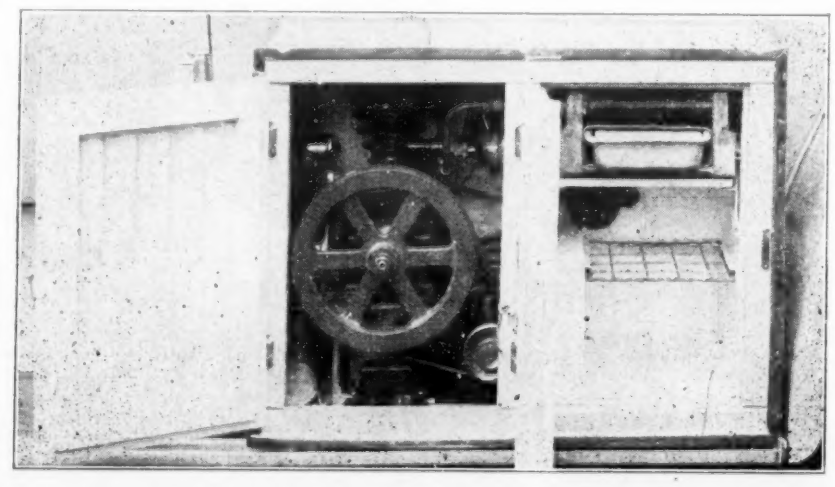
Philadelphia, Pa.—A newcomer at the recent Radio and Electric Show here was the Majestic refrigerator which is being handled by Peirce-Phelps, Inc. A number of models were on display and thousands of show visitors were on hand to see the latest product of Grigsby-Grunow Co.

In the list of exhibitors at the Philadelphia show, published on page 6 of the October 22nd issue of the NEWS, Majestic was inadvertently omitted from the line-up.

COLLENS STAYS AT HELM OF N. E. M. A.

Old Point Comfort, Va.—Clarence L. Collens, president of the Reliance Electric and Engineering Company, was re-elected president of the National Electrical Manufacturers Association at its annual meeting here October 19 to 23. Over 300 representatives were present for the fifty meetings of committees, sections and groups. Standardization and statistics were the most general topics of discussion.

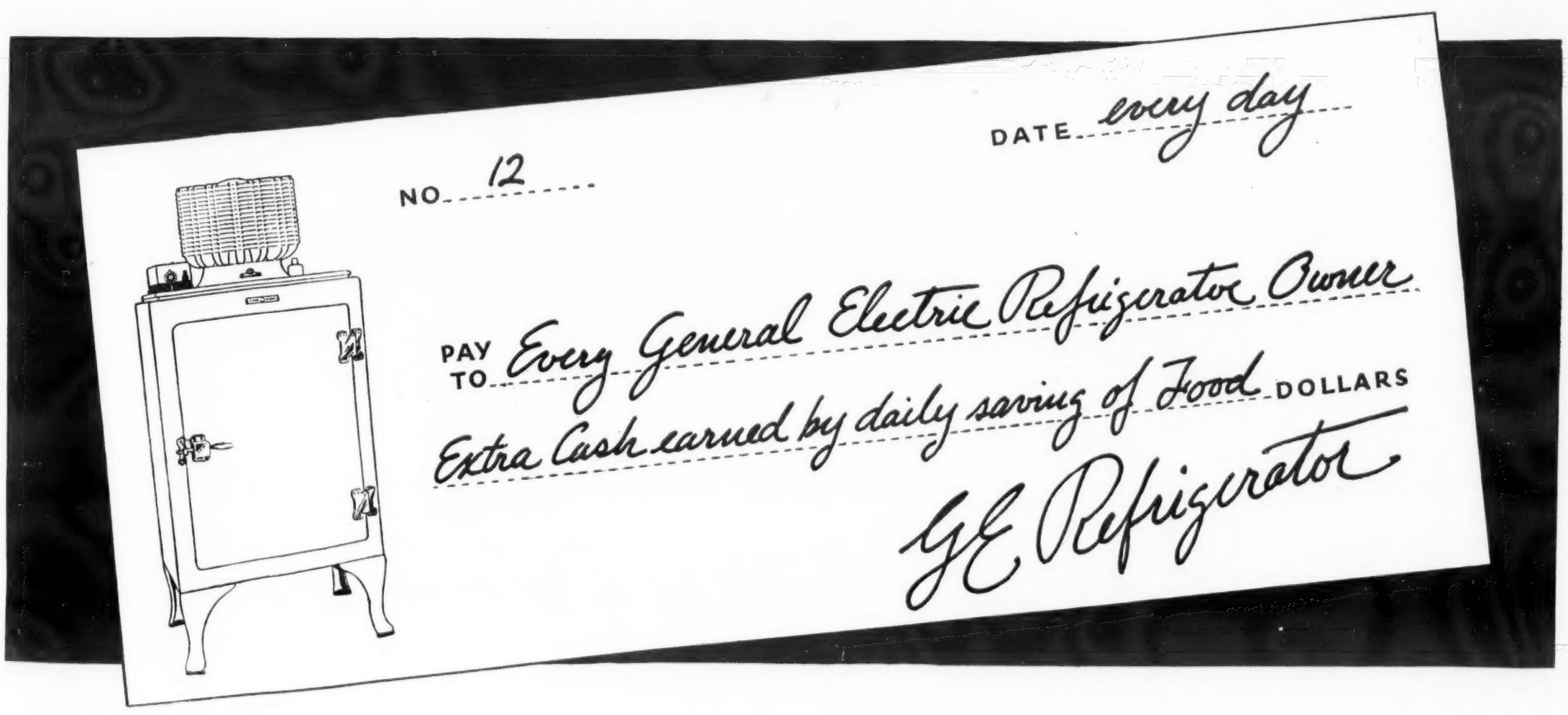
Louis Ruthenburg, president of Copeland Products, Inc., Mt. Clemens, Mich., was elected to the Executive Committee of the association.



Aspirant to Title of World's Smallest Refrigerator

to sell *them* tell *them*

The General Electric Refrigerator gives them more money to spend for food!



In at least 19 million of America's 20 million wired homes, there are men and women of moderate circumstances who are interested in economy—in making their family budgets go further. That's your cue!

They may think they can't *afford* a General Electric Refrigerator. Show them how it actually *earns* extra money for them.

It keeps milk and cream from souring—and they have more money to spend for food. It keeps meat and fruit and vegetables from spoiling—and they have more money to spend for food. It prevents waste. It gives them all the ice they need, in handy little cubes. It makes delicious frozen delicacies—quickly, easily, most inexpensively. With the General Electric Recipe Book, they can make delicious dishes out of yesterday's leftovers. And—they'll have more money to spend for food!

In 19 million homes there are people who will be interested in learning that the General Electric Refrigerator is a money-saver and a money-maker. Tell them—and sell them!

GENERAL ELECTRIC
ALL-STEEL REFRIGERATOR

ELECTRIC WATER COOLERS • COMMERCIAL REFRIGERATORS • ELECTRIC MILK COOLERS

ELECTRIC REFRIGERATION DEPT., GENERAL ELECTRIC CO., HANNA BLDG., 1400 EUCLID AVE., CLEVELAND, OHIO

REFRIGERATOR PRIZED BY PRESIDENT OF MEXICO

Mexico City, Mex.—President Pascual Ortiz Rubio, chief executive of the Mexican Republic, has purchased a Frigidaire Model AP-18. It has been installed in the modernized kitchen of ancient Chapultepec Castle here, the official residence of Mexico's presidents. The refrigerator was sold by J. B. Lewels, sales manager of the Mexican Autorefrigeration Corporation.

The sale was the result of a visit by President Ortiz Rubio to a display that the Corporation staged during a national exhibition in the National Theatre here. The chief executive manifested much interest in the display and advised Mr. Lewels that he is a refrigeration enthusiast, saying that he bought a refrigerator in the United States some six years ago. He said that he had taken it to Berlin with him and used it during his term there as Mexican minister to Germany. After that, when he became Mexican ambassador to Brazil, he took the refrigerator to Rio de Janeiro, and then brought it home to Mexico with him. Now he was ready for a new one.

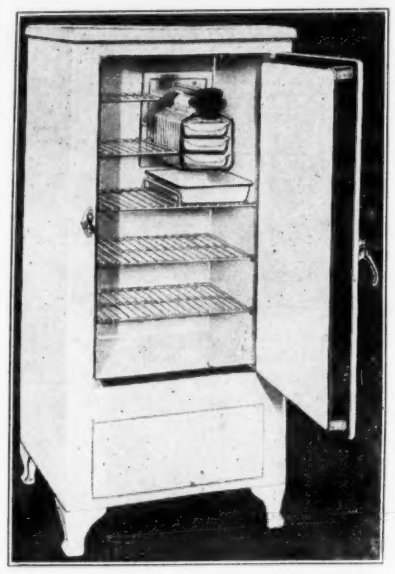
DEALER NAMED

Baltimore, Md.—A new entry in the electric refrigeration field here is that of Williams Ice-O-Matic electric refrigeration establishment at 1209 North Charles Street, which will be operated as the electric refrigeration division of Davis & Doublitz, of 902 West 36th Street, this city, plumbing and heating contractors.

ALLEN HOST TO SALESMEN

Bridgeport, Conn.—Allen Bros., Inc., 239 Fairfield Avenue, General Electric refrigerator dealers, held a salesmen's luncheon at the Stratfield Hotel recently to discuss the fall selling campaign.

Servel Hermetic Models Ready For Production



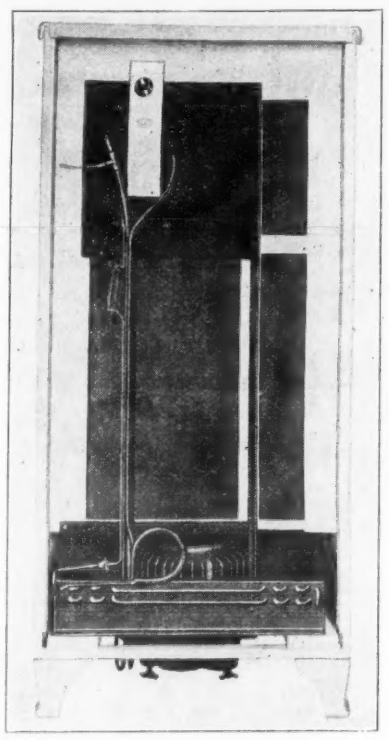
(Above)—One of the new Servel Hermetic models that will go into production the early part of this month. Shelves are set at a height so that housewives may conveniently store food. (Right)—Cooling unit installed in skeleton, cabinet frame. Removing the entire unit from the cabinet is a simple matter as only six screws are used in making it fast to the frame.

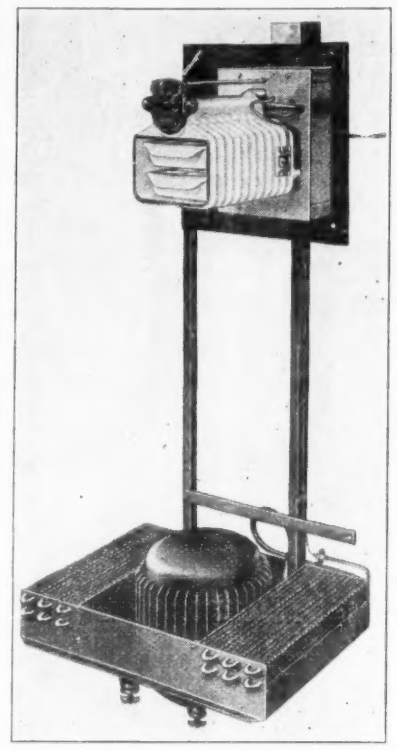
(Concluded from Page 1, Column 2)

Electrolux. The five-cubic foot model has a capacity of 63 ice cubes, totaling six pounds of ice; while the smaller jobs will make 42 cubes, or four pounds of ice.

The liner is white vitreous porcelain shells, porcelain throughout, house the chilling coils.

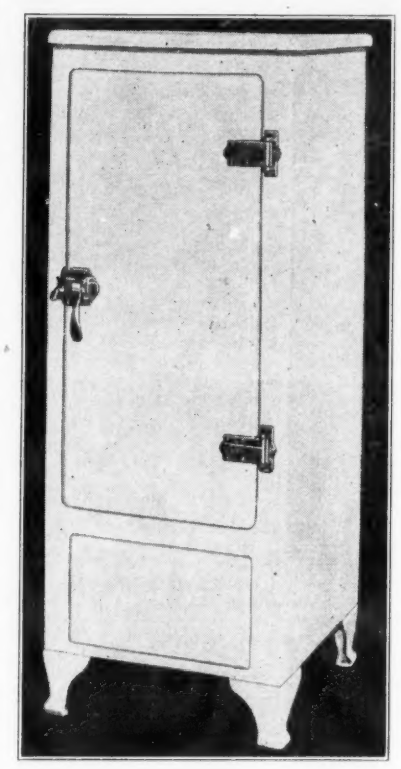
The cabinet is insulated with two inches of Celotex, and is practically identical with the box now used by





on rust-resisting steel. The Bonderited metal (patented process) exteriors are finished in white pyroxylin lacquer. Chromium plated on heavy brass is the hardware.

Several hundred thousand dollars' worth of new equipment has been installed in the Servel plants to produce the Hermetic unit, and the company is planning for production on a big scale, according to F. P. Nehrbas, vice-president of Servel, Inc.



(Above)—Another of Servel's new Hermetic models. Broom high legs are one of the features of all new Servel cabinets. (Left)—Complete condensing unit ready for installation in the cabinet.

G. E's Promotional Plans Unchanged

Cleveland, O.—Sounding the keynote for the 1931 sales campaign for General Electric refrigerators, T. K. Quinn, manager; P. B. Zimmerman, general sales manager, and Walter J. Daily, sales promotion manager of the electric refrigeration department, General Electric Company, addressed the annual fall conference of sales promotion managers of the distributor organizations.

There has been and there will be no let down in advertising and sales promotion effort, Mr. Zimmerman declared. Throughout this year he pointed out the General Electric refrigeration department has refused to recognize that there has been any kind of a business depression, and as a result of this attitude sales of General Electric refrigerators have shown a most satisfactory increase over the corresponding period of last year.

Mr. Daily told the gathering that no advertising had been cancelled this year and that no sales promotional effort had been curtailed. He added that the 1931 program would go ahead at an even greater rate.

"If I were thinking anew of a branch of business to enter, I would choose the promotional branch," said Mr. Zimmerman. "No job is second to that of a sales promotion manager. The sales promotion manager is the hope in a business depression. Imagination must be his greatest requisite, for a new lesson must be learned each morning, and the sales promotion manager must be the one who is quick to catch the spark of a new thought and to represent and express it to the men in the field. While operators of plants may chisel off small items of cost, there must be no let-down in the advertising and sales promotion activities.

"Where the way has been paved by good sales promotion, we have made our quotas, and as a result we are pleased to announce that this year truly has been a fine business year for us.

Distributors Making Progress

"The greatest satisfaction is the improvement in the distributor organization. Distributors are making studies of their markets and of opportunities. Our business is constantly becoming larger and the task of leadership therefore is great.

"We are so far removed from the saturation point that we do not discuss it—even in considering our five-year program of manufacture."

Similar expression was made by T. K. Quinn, manager of the electric refrigeration department. Mr. Quinn was most optimistic in his discussion of the electric refrigeration industry. He pointed to sales records which are now being established by the General Electric Company in the refrigeration field, and he said that it was his opinion that conditions generally could not be as bad as they are sometimes painted.

Mr. Daily outlined the extensive program for national magazine advertising, newspaper advertising, billboards, radio, direct mail and various other items coming under the head of sales promotion.

"Our policy of this year in going ahead with our original plans, regardless of talk of business hesitation, has been more than justified by sales results," he said, in pointing out that sales increases for the first nine months of this year were more than 30 per cent ahead of the first nine months of 1929.

Among the invited speakers on the program were Loring Schuler, editor of *The Ladies' Home Journal*, and Ell C. Bennett, publisher of the magazine, *Electric Light and Power*. Among the G. E. speakers on the program were W. E. Landmesser, manager of the commercial division; J. J. Donovan, manager of the apartment house division; H. H. Bosworth, manager of the public utility division; W. C. Noll, manager of the product division; A. C. Mayer, manager of the merchandise division; W. M. Timmerman, commercial engineer; A. H. Uhalt, of the merchandise division; G. C. Wasson, of the warehouse division; O. C. Hamilton, Paul H. Dow, W. A. Toker, E. H. Norling, R. C. Shaw, K. R. Davis, J. T. Dickson, Miss Edwina Nolan, of the electric refrigeration department; A. R. Stevenson, Jr., of the General Electric Co., Schenectady; Warwick Hayes, of the General Outdoor Advertising Co., and John J. West, of the International General Electric Co., London, England.

The meeting was well attended by G. E. men from all parts of the country. Among those present were:

Chas. Vaughne, Ohio Public Service Co., Cleveland, O.; C. L. Dunn, Ohio Public Service Co., Cleveland, O.; I. M. Lackey, Electric Refg. Co. of N. E., Boston, Mass.; E. F. Fyler, Page-Morris, Inc., Albany, N. Y.; Helen M. Murray, Cushman Refrigeration Co., Cleveland, O.; H. N. Trumbull, Cushman Refrigeration Co., Cleveland, O.; R. A. Sholl, Judson C. Burns, Philadelphia, Pa.; L. W. Driscoll, Southern Refrigeration Co., Charlotte, N. C.; E. B. Coghlin, Coghlin Electric Co., Worcester, Mass.; Louise Gross, Ahrens Refrigerator Co., Oklahoma City, Okla.; C. F. Davis, Bard-Barger, Inc., Columbus, O.; H. Ratcliffe, R. Cooper, Jr., Inc., Chicago, Ill.; H. M. Cook, H. G. Bogart Co., Toledo, O.; Warwick Hayes, General Outdoor Advertising Co., Cleveland, O.; Gayb Little, Geo. Belsey Company, Ltd., Los Angeles, Cal.; E. M. Diehl, The Willis Co., Akron, O.; A. H. Linenberg, Rex Cole, Inc., New York, N. Y.; E. H. Campbell, Rex Cole, Inc., New York, N. Y.; Harry J. Taillie, Rochester Gas & Elec. Corp., Rochester, N. Y.; Le Moine C. Wheeler, Wheeler-Consler Corp., Rochester, N. Y.; A. H. Johnson, The Hines Company, Baltimore, Md.; John O. Raplee, Electric Refrigeration Co., Louisville, Ky.; Howard Droegkamp, E. H. Schaefer Corp., Milwaukee, Wis.; E. H. Langdon, International Gen. Elec. Co., New York, N. Y.; J. J. West, International Refrigerator Co., London, W. I.; Thos. E. Babson, P. H. Harrison Co., Newark, N. J.; H. L. Parsons, Newton-Parsons Co., Hartford, Conn.; H. E. Warren, Hoosier Elec. Refg. Corp., Indianapolis, Ind.; Raymond C. Hall, Commonwealth Refrigeration Co., Richmond, Va.; James L. Pauso, Mueller-Shannon, Inc., Minneapolis, Minn.; [illegible] E. Watson, Griswold-Rogers, Inc., Dallas, Tex.; L. W. Morris, W. D. Alexander Co., Atlanta, Ga.; Bruce McDonald, Canadian General Elec. Co., Toronto, Canada; Ross A. Taylor, Campbell-Ewald Co., Toronto, Canada; E. G. Potter, Erco, Inc., Buffalo, N. Y.; R. W. Evans, Ochiltree Electric Co., Pittsburgh, Pa.; J. M. Milhon, McCormick-George Co., Detroit, Mich.; Jack Spiers, H. & G. Refrigeration Co., Greenville, S. C.

FULL SPEED AHEAD!

NO OTHER industry offers greater prospects or greater profit-possibilities than electric refrigeration. And no franchise in the electric refrigeration industry offers *more* than the Kelvinator Franchise.

Kelvinator is going steadily *forward*. 1929 was the biggest year in Kelvinator's sixteen years in the domestic electric refrigeration business. 1930 far surpassed 1929, setting up another record—31% greater than 1929. And prospects for 1931 indicate that, again, Kelvinator will move steadily forward to new and greater achievements.

It will pay you to get the Kelvinator story for 1931. If you are in open territory and eligible for a distributorship, write the Factory direct and let us have one of the Kelvinator District Managers call on you and give you the *facts and figures* about Kelvinator and about your opportunity with Kelvinator. If you are interested in a dealership, get in touch with the Kelvinator distributor in your nearest large city or, write the Factory direct.

Now is the time to start making your plans for 1931. Kelvinator's plans for 1931 are completed—all set, ready to go, for another GREAT YEAR! They are fully covered in one book—"Full Speed Ahead"—which will be shown and explained to you upon request to either the Kelvinator Distributor in your territory, or to the Factory. Kelvinator is recognized as the BIG OPPORTUNITY in 1931—it can be *your opportunity*—get the facts NOW!

KELVINATOR SALES CORPORATION, DETROIT, MICHIGAN
Kelvinator of Canada, Limited, London, Ontario
Kelvinator Limited, London, England

KELVINATOR

(155)

Sales Department, Kelvinator Sales Corporation,
14245 Plymouth Road, Detroit, Michigan.

Gentlemen:

I am interested in the Kelvinator Franchise. Please have your representative call and show me the BIG KELVINATOR PROGRAM FOR 1931.

*Name*_____

*Street Address*_____

*City and State*_____

REFRIGERATION CRASHES PORTALS OF RADIO SHOW

Chicago, Ill.—Refrigeration for the first time crashed the portals of the annual Radio Show held here October 20-25. Several refrigeration exhibits were intermingled with the many ones that featured radios and equipment. During the week record crowds attended the show and many visitors found their way to the refrigeration exhibits to inspect the models on display.

This will be the last Radio Show to be known under that name. It has been decided to include household appliances of all kinds along with radio sets and equipment. Next year the event will be called the Radio and Household Appliance Show. This change was due to the fact that several radio manufacturers also build refrigerators and wished to show their complete lines. The new setup was not decided upon in time to secure the representation of many non-radio lines at this year's show.

The Majestic refrigerator, one of several exhibited, revealed pre-natal influences in a device for tuning in the degree of cold desired. This innovation resembles the tuning control of a radio set. It sells for $195 and up, and advertising will begin in December issues of women's magazines and newspapers.

Other features of the Radio Show included a daily demonstration of broadcasting and talking pictures by the National Broadcasting Company, several applications of the photo-electric cell and grid glow tube hook-up with which automobiles, machinery and various devices can be operated with the voice or a ray of light, a talking marathon and the Grigsby-Grunow electro-surgical unit known as the radio knife.

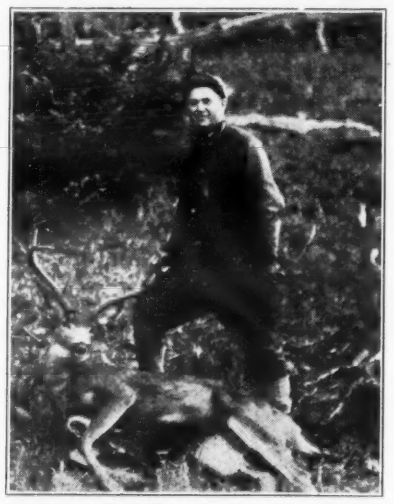
Men contestants outnumbered the women in the talking marathon. Participants were required to talk continuously 45 minutes out of every hour from the start of the show on Monday until the contest was decided.

The Grigsby-Grunow radio knife was not exhibited with the idea of selling the ultimate consumer on competitive surgical technique, but was displayed as a by-product of radio research. The knife is heated by short radio waves while in use, cauterizing its own incision.

Radio sets on display indicated the progress of two forms of competition—one for smaller and better sets and the other for trickier gadgets.

STORZ AND PARTY BAG DEER; G. E. DEALERS FEAST

Omaha, Neb.—It is not all work with A. C. Storz, president of the Storz Electric Refrigeration Co. of Omaha. The week of October 5-11 was spent in the Colorado mountains near Aspen, hunting deer. Storz and two Omaha friends succeeded in shooting seven black-tailed



deer. The carcasses were brought to Omaha and stored for a week in one of the G. E. commercial boxes.

A school for G. E. dealers in the Storz territory was held at the offices in Omaha, Oct. 23 and 24. A banquet at the Fontenelle Hotel was part of the program, and the venison was on the menu. W. P. Smith, R. F. Roider, C. Muir and F. M. Corliss, of the G. E. laboratories at Schenectady, N. Y., were the instructors at the school.

NEW JERSEY SALESMEN POCKET CASH AWARDS

Newark, N. J.—Leading refrigeration salesmen of the Public Service Corporation of New Jersey were somewhat the richer after third quarter cash prize awards were distributed.

M. Schwartz, of Jersey City, pocketed the $75 award; A. Danielson, North Hudson, $50; W. Higgins, Orange, $30; A. Feuling, Newark, $25; L. Buyatt, Bayonne, $20; R. Wann, Hackensack, $15; T. Kessler, Plainfield, $10.

In addition to the foregoing, the following refrigeration representatives also qualified for prizes by obtaining the minimum of $5,000 in sales: F. Dunning, Montclair; N. Zeilberger, Perth Amboy; J. Blume, Newark; W. Gundrum, Elizabeth; J. Arthur, Jr., Elizabeth.

These prizes are awarded each quarter to the representatives obtaining the largest amount of dollar sales during the quarter.

SPRINGFIELD NEW HOME OF WESTINGHOUSE DEPT.

Springfield, Mass.—The Refrigeration Engineering Department of the Westinghouse Electric and Manufacturing Company was moved from Mansfield, Ohio, to this city November 1, according to an announcement made by M. C. Terry, manager.

Little or no trouble was encountered in moving the department. A contract was made with the Pioneer Storage Company, acting for the Allied Van Lines, Inc., to move all of the department's equipment and all of the employees' household goods in one big caravan. Through this method the department worked until October 30 in Mansfield. The equipment was loaded that day, shipped the following day, and Monday, November 3, the first working day of the month, found the department in working order in Springfield.

MAJESTIC ALL SET IN CINCINNATI AREA

Cincinnati, Ohio—The Majestic Distributing Company of Cincinnati, 1042 Gilbert Avenue, is a busy place these days. George H. Deacon is president of the Majestic Distributing Company of Cincinnati; Neal C. Johnson is sales promotion manager, while L. J. Melvin is sales manager for Majestic refrigerators. Ralph E. Smoot is manager of the service department.

There are 45 employes in the Majestic Distributing Company of Cincinnati, and 200 dealers in their territory, which covers 38 counties of Ohio, Indiana and Kentucky. Some of the principal towns in the Ohio territory are Hamilton, Middletown, Dayton and Springfield.

YUKON MAKES GOOD START IN NEW YORK

New York, N. Y.—The first order received by the New York Kelvinator branch for the new Kelvinator Yukon model came from the Amalgamated Clothing Workers for the co-operative apartment building under construction in downtown New York. The order was for 231 Yukons for a new building under construction.

The big apartment house of the Amalgamated Clothing Workers on Moshula Parkway, in uptown New York, when completed will have installed 500 Kelvinators. Contract for these was made before the Yukon model came out.

NEW APARTMENT INSTALLS SERVEL EQUIPMENT

Evansville, Ind.—Evansville's newest apartment building — the Cambridge Arms, First and Walnut Streets—which was opened November 1, has been equipped with Servel refrigeration, according to Edward McGinness, sales supervisor, Southern Indiana Gas & Electric Company, distributor who made the installations in thirty-two suites.

DIERKES TO DIRECT WELSBACH SALES

Gloucester, N. J.—J. M. Dierkes, district manager for Welsbach in the Boston, Mass., territory, has been transferred to the factory here to take charge of sales.

STAR SALESMEN SPORT WESTINGHOUSE FOOTBALLS

Mansfield, Ohio—Westinghouse football critics have completed the task of selecting three "all Westinghouse" teams from the salesmen who romped the gridiron in the recent football contest staged by the Refrigeration Department. The triple threat men who made the first "all Westinghouse" team are the proud owners of gold footballs. Second and third teams were awarded silver and bronze footballs. Philadelphia and Pittsburgh placed seven men on the first "all-Westinghouse" team. The teams with their captains are listed below:

(First Team)—Captain R. A. McLarnon, Philadelphia; R. Graham, Philadelphia; Harvey M. Hale, Philadelphia; R. H. Spencer-Smith, Detroit; M. L. Kidner, Pittsburgh; J. G. Rigdon, Pittsburgh; Joseph Coyle, Boston; M. R. Baker, Pittsburgh; George R. Dessen, Philadelphia; Larry Davis, Boston, and B. M. Huerkamp, Louisville.

(Second Team)—Captain H. E. Allmang, Philadelphia; W. C. Gartner, Pittsburgh; J. P. Tooel, Pittsburgh; E. S. White, Philadelphia; W. C. Stiver, Jr., Philadelphia; Earl Jones, Pittsburgh; James Prendergast, Boston; L. E. Samuelson, Pittsbugh; J. J. Fielding, Louisville; R. S. Knorr, Philadelphia, and Stanley Tagan, Philadelphia.

(Third Team)—Captain P. A. Sugrue, New Haven; Ray Cadden, Boston; T. B. Wilson, Pittsburgh; Reuben Jones, Nashville; L. H. Everett, Louisville; A. T. Thawley, Philadelphia; William Moyer, Philadelphia; Harry L. Donaldson, Pittsburgh; B. M. Roberts, Louisville; W. P. Bevan, Pittsburgh, and Luke Crow, New Haven.

KELVINATOR AND NORGE CLOSE DEALS

San Francisco, Calif.—Kelvinator refrigeration will be installed in the $60,000 three-story apartment structure to be built at the northeast corner of North Point and Broderick Streets, San Francisco, by Robinson & Johnston, owners and builders, 871 31st Ave., same city.

Norge Refrigerator Co., 111 O'Farrell Street, will install refrigerators in the five-story apartment building at 709 Geary Street, the property of the Louis Friedman Estate. This entire apartment building is to be improved at a total cost of $25,000, the major improvement being the installation of a refrigerator in each apartment.

WAYNE MEN PREPARING FOR SEATTLE MEETING

Seattle, Wash.—Northwestern dealers of Wayne electric refrigerators and oil burners will gather in Seattle early in December for a conference that will last an entire week.

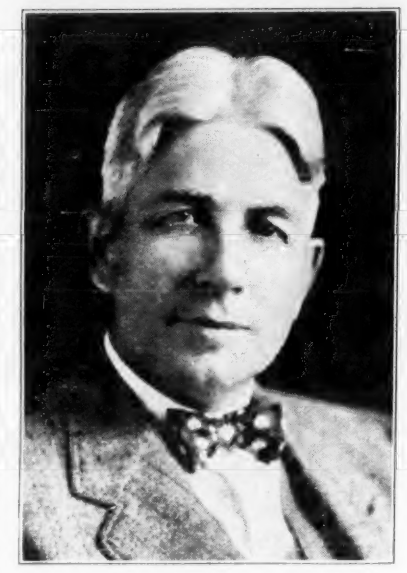
R. C. Wood, president of the Washington Home Equipment, Seattle, distributors for Wayne line, will be in charge.

McCRAY LEASES QUARTERS IN DAYTON

Dayton, Ohio—The McCray Refrigerator Sales Corporation has leased the large storeroom at 110 East Second Street, this city. The space in a leading downtown business section will be immediately made ready for display and sales purposes, it was said by G. E. Kent, distributor for the McCray Company.

Play Important Part in Big Merger

E. T. Murphy



J. I. Lyle

S. B. Carpender

(Concluded from Page 1, Column 1)

is generally looked upon as the father of air conditioning. As early as 1902 he developed his spray type of humidifier and dehumidifier, closely followed by his invention of the dew-point control. Later he established a rational, accurate method of estimating fan-system heating capacities and requirements on the B. T. U. basis. In 1911 he presented the rational psychometric formula, and from this set up the psychometric chart, which has since been in general use by engineers in all types of air conditioning calculations. One of his recent inventions was the centrifugal refrigerating system, using a liquid refrigerant.

The Brunswick-Kroeschell Company is the outgrowth of the merger in 1922 of the Brunswick Refrigerating Company of New Brunswick, N. J., the Kroeschell Brothers Company, and the Kroeschell Brothers Ice Machine Company of Chicago. It has plants in both cities and maintains a complete line of commercial refrigerating machines for every cooling or freezing requirement. Besides a large business in institutional and industrial refrigerating installations, it does a large proportion of the marine refrigeration business in this country. Its machines are now on more than 3,000 American vessels. It has one subsidiary, the Impex Corporation of New Brunswick, N. J. J. W. Johnson is president and Sydney B. Carpender is vice-president and general manager.

W. H. Carrier

The York Heating and Ventilating Corporation is a Philadelphia concern organized in 1919, with a plant located at Bridgeport, Pa. It developed the unit system of industrial plant heating and cooling on a mass production basis, and originated the unit method of air conditioning. Like Carrier, the company has done a great deal of research work, and it has highly organized manufacturing and sales facilities. The principal officers are Thornton Lewis, president; H. P. Gant, vice-president in charge of sales, and Donald E. French, vice-president in charge of production. Mr. Lewis and Mr. Gant are both former presidents of the American Society of Heating and Ventilating Engineers, as also is Mr. Lyle. Mr. Lewis was also associated with many of the Carrier executives in the Buffalo Forge Company.

John M. Bickel, formerly advertising manager for the Electrolux and Servel refrigerators and sales manager of the Holmes Products, Inc., has been appointed sales manager of the Carrier-Lyle Corporation of Newark.

J. M. Bickel

Thornton Lewis

H. P. Gant

STANDARD SAFETY CODE GETS FINAL APPROVAL

(Concluded from Page 1, Column 1)

approved the code may be gained from the following list:

American Institute Refrigeration
Fred Ophuls, Consulting Engineer
112 W. 42nd St., New York, N. Y.

The Refrigerating Machinery Association
A. H. Goelz, Vice-President
Brunswick-Kroeschell Co.
4221 Diversey Ave., Chicago, Ill.
J. I. Lyle, Vice-President
Carrier Engineering Corp.
Newark, N. J.
F. R. Zumbro, Research Engineer
Frick Company, Inc.
Waynesboro, Pa.

American Chemical Society
F. G. Keyes, Professor
Mass. Inst. of Tech.
Cambridge, Mass.

American Gas Association
N. T. Sellman
Consolidated Gas Co.
130 E. 15th St., New York, N. Y.

American Institute of Electrical Engineers
George E. Wells, Consulting Engineer
Bootman's Bank Bldg., St. Louis, Mo.

American Society of Civil Engineers
A. B. Heiser, Consulting Engineer
76 Rombont Ave., Beacon, N. Y.

American Society of Heating and Ventilating Engineers
Lee Nusbaum
Pennsylvania Engrg. Co.
1119 N. Howard St., Philadelphia, Pa.

American Society of Mechanical Engineers
B. H. Coffey, Consulting Engineer
Dehart Place, Elizabeth, N. J.
Louis Doelling
75 Maple Ave., New Rochelle, N. Y.
Walter Jones, Vice-President
Brunswick-Kroeschell Co.
New Brunswick, N. J.
R. F. Massa
1085 Park Ave., New York, N. Y.
C. R. Neeson, Chief Engineer
De La Vergne Machine Co.
Richmond and Norris Sts., Philadelphia,
C. C. Spreen
Kelvinator Corp., Detroit, Mich.
John E. Starr, Consulting Engineer
90 West St., New York, N. Y.

American Society of Refrigerating Engineers
George B. Bright, Consulting Engineer
2615 12th St., Detroit, Mich.
Van R. H. Greene, Consulting Engineer
2 Lafayette St., New York, N. Y.
D. R. Harper, Professor
Union College, Schenectady, N. Y.
F. E. Matthews, Consulting Engineer
216 Leonia Ave., Leonia, N. J.
Stuart Otto
18 East 41st St., New York, N. Y.

American Warehousemen's Association
G. A. Horne, Vice-President
Merchants Refrigerating Co.
17 Varick St., New York, N. Y.

International Association of Governmental Labor Officials
M. H. Christopherson
N. Y. State Insurance Fund
124 East 28th St., New York, N. Y.

Compressed Gas Manufacturers Association
F. R. Fetherston, Secretary
120 West 42nd St., New York, N. Y.

Eastern Ice Association
W. H. Ross
Bardonia, N. Y.

International Acetylene Association
H. D. Edwards, Consulting Engineer
Linde Air Products Co.
30 East 42nd St., New York, N. Y.

International Association of Industrial Accident Boards and Commissions
J. F. Scott
Steam Boiler Inspection Bureau
Department of Labor, Trenton, N. J.

Bureau of Safe Transportation of Explosives
G. E. Carleton
30 Vesey St., New York, N. Y.

National Association of Ice Industries
George Lange, Vice-President
American Ice Co.
41 East 42nd St., New York, N. Y.

National Association of Practical Refrigerating Engineers
W. C. Dunbarr
7 Vale St., Natick, Mass.

National Bureau of Casualty & Surety Underwriters
O. J. Smith
U. S. Casualty Co.
80 Maiden Lane, New York, N. Y.

National Electrical Manufacturers Association
Glenn Muffly
Copeland Products, Inc.
Mt. Clemens, Mich.
E. T. Williams
Servel, Inc.
51 East 42nd St., New York, N. Y.
R. A. McCarthy
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

National Electric Light Association
C. K. Nichols
New York Edison Co.
124 East 15th St., New York, N. Y.

National Fire Protection Association
H. E. Newell
National Board of Fire Underwriters
85 John St., New York, N. Y.

National Safety Council
J. I. Banash
168 N. Michigan Ave., Chicago, Ill.

New York Board of Fire Underwriters
William B. White
Bureau of Surveys
85 John St., New York, N. Y.

New York City Bureau of Fire Prevention
C. K. Michaels
Municipal Bldg., New York, N. Y.

Underwriters Laboratories
S. V. James
Underwriters Laboratories
207 East Ohio St., Chicago, Ill.

United States Bureau of Standards
George F. Stevens
Bureau of Standards
Washington, D. C.

U. S. Department of Labor
J. F. Dalton
Room 619, St. Dennis Offices
11th and Broadway, New York, N. Y.

NEWTON-PARSONS CO. HOST TO G. E. MEN

Hartford, Conn.—The Newton-Parsons Co., distributors of General Electric refrigerators, held its annual fall banquet and entertainment recently at the City Club here. About 60 attended the affair and many from out of the city were represented in the gathering.

H. Livington Parsons, of the Newton-Parsons Company, acted as toastmaster at the banquet, which was followed by a program of entertainment. L. H. Knapp, sales manager of the Hartford Electric Light Company, was the principal speaker of the evening. Among those present were John W. Coughlin, of the Coughlin Electric Co., Worcester, and Frederick Harvey, district representative for the General Electric Company.

BUSY ON COMMERCIALS

Bridgeport, Conn. — Three walk-in coolers have been installed recently by the L. M. Reed Corporation, 347 Fairfield Avenue, Copeland distributors for Fairfield and Litchfield counties and part of New Haven county.

A 7 x 7 x 9 meat cooler was placed in the market of John J. Wagner, White Street, Danbury, equipped with a W compressor and Copeland-Larkin coil. A 7 x 5 x 9 meat box was installed for Ira J. Waters, Brookfield, carrying an R compressor and Copeland-Larkin coil. The third installation was in the Doughnut Shop, West Main Street, Waterbury, consisting of a 7 x 6 x 7 bakery cooler with R compressor and Copeland-Larkin coil.

ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

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Phone Lexington 9113

VOL. 5, No. 5, Serial No. 107, Part 2 — November 5, 1930

Approved At Last

FINAL approval by the American Standards Association of the Safety Code for Mechanical Refrigeration prepared by the American Society of Refrigerating Engineers brings a much discussed problem a step nearer to a solution. This code, while admittedly short of perfection and interlarded here and there with compromises of one sort or another, deserves a fair trial.

No one can doubt the desirability of having a uniform refrigeration code adopted by as many municipalities as possible. Such a procedure would save money and eliminate trouble for everyone concerned. It would make it possible for manufacturer, distributor, designer, architect, builder and owner to install refrigeration systems in all "code cities" with a minimum of difficulty.

In the copies of the new code which were printed some time ago by the A. S. R. E., the following "Foreword" was printed:

"The Safety Code for Mechanical Refrigeration has been formulated under the direction of the American Society of Refrigerating Engineers, operating under American Standards Association procedure.

"Most of the refrigeration producing equipment for the requirements of both the home and the commercial establishment are produced by companies engaged in a nation-wide business. It is thus hoped that this code may be universally adopted, or its provisions so incorporated in any ordinances or laws that refrigerating machines everywhere may be similar, thereby permitting their manufacture in quantities to supply mechanical refrigeration at a minimum cost.

"The refrigerating industry is continually changing, and it will undoubtedly be found that the present rules will need revision with advancements in the art. For this purpose a standing committee is provided to formulate new rules for new types of refrigerating equipment, and uses of new refrigerants, as the demand requires.

"It is urged that where it is possible to do so these rules and regulations be adopted as a *code*, so that future advisable and proper changes may become a part of *local rules and regulations* as they are developed. By such a procedure the public can obtain quickly the advantages of advancement in the art of refrigeration. The form and arrangement of the code is such that the regulations covering any type of system may be modified without reference to other types of systems, and without extensive changing of the section or paragraph numbering."

This standard code is the result of years of research and study. The words printed above show the liberal attitude of its sponsors. It should have every chance to succeed.

Betrayed By Its Friends

AN editorial in the October 8th issue of the NEWS discussed under the heading "Questionable" the tendency of the refrigeration industry to follow the custom of the automobile industry by advertising "F. O. B. Factory" prices. The suggestion was made, that inasmuch as the customer could not buy a refrigerator at the advertised price, the quoting of these "factory" prices created a possible element of deception that in the long run might have a bad effect, and undermine the public's confidence.

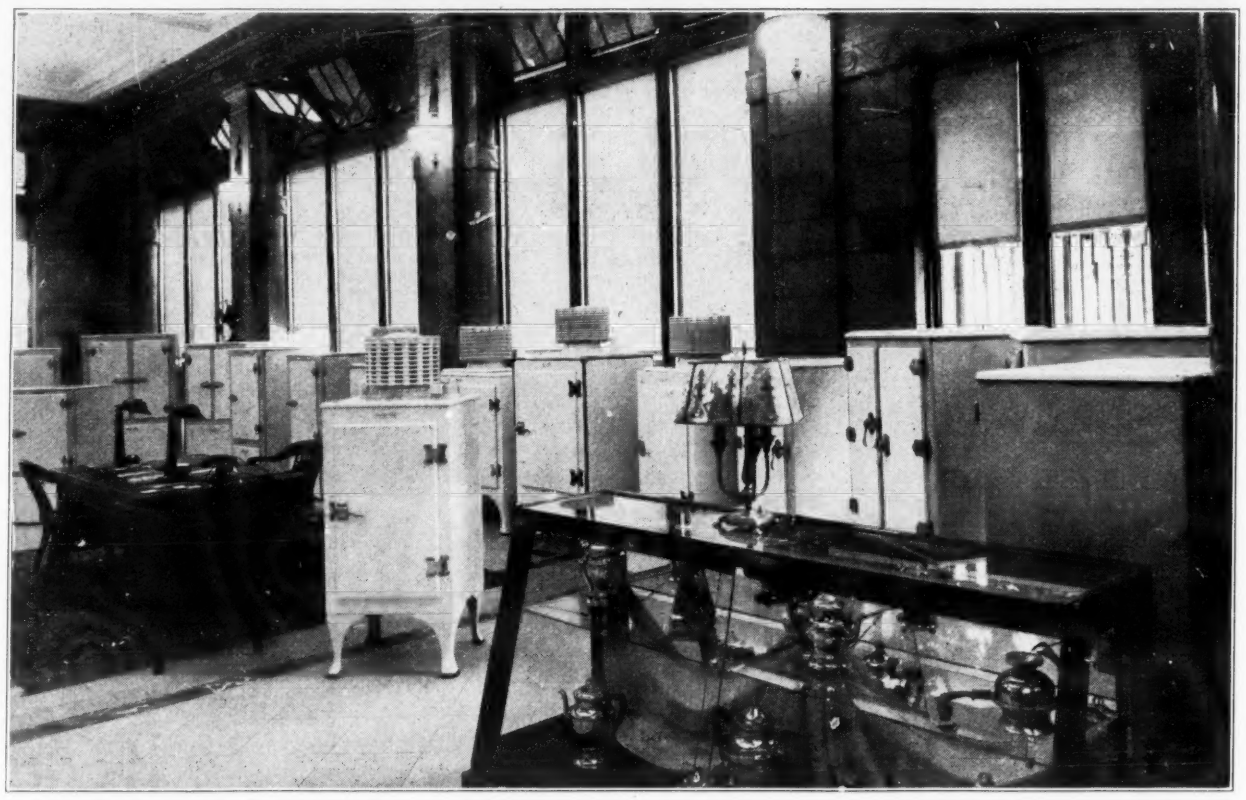
It was argued that everything the automobile industry has done is not necessarily wise, and that the refrigeration industry ought to stand on its own feet and do its own thinking so far as its relations with the public were concerned.

Now comes one of the well known automobile manufacturers with advertising in the daily newspapers, which make capital of the fact that the custom of printing only "F. O. B. Factory" prices has possessed an element of deception. This advertising of the Nash car begins with a big headline "Destroying Price Camouflage" and continues with a price list, not "F. O. B. Factory" but delivered to the customer.

This move from within the ranks of the industry, that is the most conspicuous user of this questionable method of advertising prices, would seem to indicate that its value is doubted even in the home of its friends.

Why then should the refrigeration industry, an industry that deals in the precious commodity known as health, adopt a practice that is not finding full favor in the field in which it has been so extensively used?

Quartet on Display



EXECUTIVE SEES PRICE A BIG FACTOR TO DEALERS

A PICTURE of the conditions in the refrigeration industry from the viewpoint of a prominent officer of one of the best known refrigerator manufacturers, is presented in the following letter, which was written by the vice-president in charge of sales for that manufacturer upon his return from an extended trip. For obvious reasons he prefers that his name be not mentioned. Here are his views:

"The writer has just completed a three weeks' tour of most of the western cities in connection with our business on electric refrigeration, and I would like very much to give you my observations of what I found in the field, which have reference, generally, to all manufacturers, regardless of their size.

"I had the pleasure to visit St. Louis, Kansas City, Denver, Salt Lake City, Los Angeles, San Francisco, Oakland and Seattle, and while I found considerable activity in most of these large cities on the part of two of the leading manufacturers, there was considerable evidence that these same manufacturers were having some difficulty in holding distributors by reason of the trend of the industry to a low price, small cabinet, which did not permit a satisfactory profit to the distributor.

"There seems to be a lessening of direct manufacturers' interest in branch offices, or, at least, there seems to be a desire on the part of, at least, three of the large leading four manufacturers to reduce the sales overhead in connection with direct selling.

"I talked with radio distributors, auto accessory distributors, piano and music stores that are distributors for other products, and many others that were extremely interested in the sale of electric refrigeration, but the big obstacle in their success, as they described it, was their desire to buy a standard equipment of proven worth to sell at prices considerably lower than generally advertised products of the same quality, and then expect the manufacturer to give them a discount that is proportionate to the discount they were receiving on radios, pianos, and other equipment that, in the past, has not required the same cost of servicing as electric refrigeration.

"There is every evidence, from existing distributors and others who have the ability to merchandise this equipment and who may take it on in the future, that a great percentage of our volume will come from the sale of a low price cabinet, and because of the activity of department, furniture and chain stores, I believe that we can expect that a great percentage of our entire volume will come from a small low price cabinet and be handled direct by this class of stores, where it is not necessary for the manufacturer to go to the expense of putting on a resale organization or an extensive advertising campaign.

"I believe that business conditions, generally, in the West are looking upward, because I found any amount of merchants who admitted that business had been extremely poor during the past nine months and who seemed to be optimistic about their possibilities in the future."

PARSONS COMPANY TO SELL RADIOS

Kansas City—The R. E. Parsons Company here have taken on General Motors Radio to supplement Frigidaire sales during the winter months.

Boston, Mass.—The Edison Electric Illuminating Company is showing four makes of electric refrigerators: Frigidaire, Kelvinator, General Electric and Westinghouse.

The main electric refrigerator display room of the Edison Company, formerly on the second floor of the Edison Shop, now occupies a section of the first floor of the company's general offices at 39 Boylston Street. This location is such that nearly everyone who enters the building sees the display of refrigerators, and sales have increased substantially in these new quarters.

"REFRIGERATIONIST"

September 23rd, 1930.

F. M. Cockrell, Esq.,
Publisher,
Electric Refrigeration News,
Detroit, Mich.

Dear Mr. Cockrell:

As my friend, Mr. R. Searle, Managing Director of Messrs. Kelvinator, Ltd., informs me that on his intending trip to the United States he will be visiting your goodself, I take this opportunity of sending to you, through his good instrumentality, a fraternal message of greeting.

I should like you to know how much I, as a refrigerationist, and one whose charge it is to keep abreast of all that is going forward in the refrigeration world, appreciate the message and the mission which the "ELECTRIC REFRIGERATION NEWS" is fulfilling on behalf of small units refrigeration everywhere.

We in the Old Country, in spite of the heavy commitments which the burden of the times place on us, are making a big, and I venture to hope not unsuccessful, effort to re-equip our food industries and sections of our social service with temperature control systems, and we cannot forego acknowledgment of the example which America is setting us in many ways in this direction. You do not need me to tell you that the "ELECTRIC REFRIGERATION NEWS" is read outside of its own country; all I can do is to express appreciation of it as a reader.

With best wishes for your good work,

Yours sincerely,

J. RAYMOND,
Editor-Proprietor.

"FAMILIAR FACES"

THE CITY ICE AND FUEL COMPANY
of Cleveland

October 28, 1930.

Mr. George B. Bright,
Detroit, Mich.

Dear George:

I haven't answered the last letter I received from you, because I didn't know it really required an answer. Wish to say this, however, that it was "dog-gone" kind of you to invite me to visit with you and your folks at Detroit recently. That's—that.

Your letter stated that you appreciated my being there. I am never very content when away from the work bench. Do not enjoy travel; neither do I care to take the multitude with me when I happen to go away, and the same thing holds good with meeting multitudes while in other cities. However, at your meeting, George, I did see many old, familiar faces, and after it is all said and done, I consider the visit to have been not only enjoyable but possibly profitable.

Cordially yours,

H. D. NORVELL.

FRIGIDAIRE ROUNDS OUT BALTIMORE SALES STAFF

Baltimore, Md.—In keeping with its policy of having efficient distribution in the territory it covers, the Baltimore branch of the Frigidaire Sales Corporation is continuing to appoint dealerships in strategic locations. Recent concerns which have taken on retail distribution of the Frigidaire include M. Shaivitz & Sons, 816 South Charles Street; the Hubert Plumbing & Heating Company, 330 St. Paul Street; Jack Schweitzer, 2031 West North Avenue, and Ford Bros. Motor Co., 2034 Frederick Avenue.

Other dealers, which are handling the Frigidaire in this territory, include the large department store of Hochschild, Kohn & Co.; the United Auto Sales Co., 200 West North Avenue, a large automobile dealer which also maintains a distribution point at Dundalk; Fred. Hemmeter, Jr., 22 S. Charles St.; Community Electric Co., 5204 Belair Road; E. E. German, Towson, Md.; Dahlmer-Kennedy Co., 1300 N. Central Ave.; T. R. Caltrider, Pikesville, Md.; G. B. Caltrider, Reisterstown, Md.; Electrical & Hardware Co., Belair, Md.; Service Stores Corp., Sparrows Point, Md.; Warner Motor Co., Annapolis, Md.; Peddicord Sales & Service Corp., Ellicott City, Md.; Worth & Miller Radio Co., Sparrows Point, Md.; Bunswick Music Shop, 420 S. Conkling St., and Ketterer & Grau, 2830 Edmondson Ave.

All of these dealers supplement the work of the sales and display rooms which the Frigidaire Sales Corporation maintains at Howard and Mulberry Streets, Baltimore, Md. The branch factory headquarters are in the Candler Building.

NEW DEALERS TO SELL STARR FREEZE REFRIGERATOR

Richmond, Ind.—The Starr Piano Company, manufacturers of the Starr Freeze refrigerator, has appointed a number of new dealers in middle western cities. Among them are: G. W. Hubbard Hardware Co., Flint, Mich.; The Kirk Co., Indianapolis, Ind.; The Dilgert & Sprau Co., Sandusky, Ohio; Mantonyer Electric Shop, Newark, Ohio; Mox Meyers Stove Store, Mt. Vernon, Ohio; A. R. Congdon & Sons, Ypsilanti, Mich.; Minard Furniture Co., Pontiac, Mich.; The Danford Co., Wooster, Ohio; John Rufener Hardware, Chagrin Falls, Ohio; Lake County Hardware Co., Willoughby, Ohio; Muntz & Wright, Greenville, Pa.; E. L. McKelvey Co., Youngstown, Ohio; The Yeager Co., Akron, Ohio; Trumbull Plumbing & Supply Co., Warren, Ohio.

BURMAN TAKES POST WITH DETROIT BRANCH

Detroit, Mich.—A. J. Burman, formerly California regional sales representative for Copeland with headquarters at Los Angeles, has recently joined the Copeland Detroit Branch in the capacity of chief of service operations. For more than a decade, Mr. Burman has been associated with the electric refrigeration industry. His experience covers the entire field, both from the sales and service angles.

In 1926 he became a member of the Copeland organization and for three years conducted a service school at the factory. In January of this year he was sent to California and served there up until the time of his transfer to the Copeland-Detroit branch.

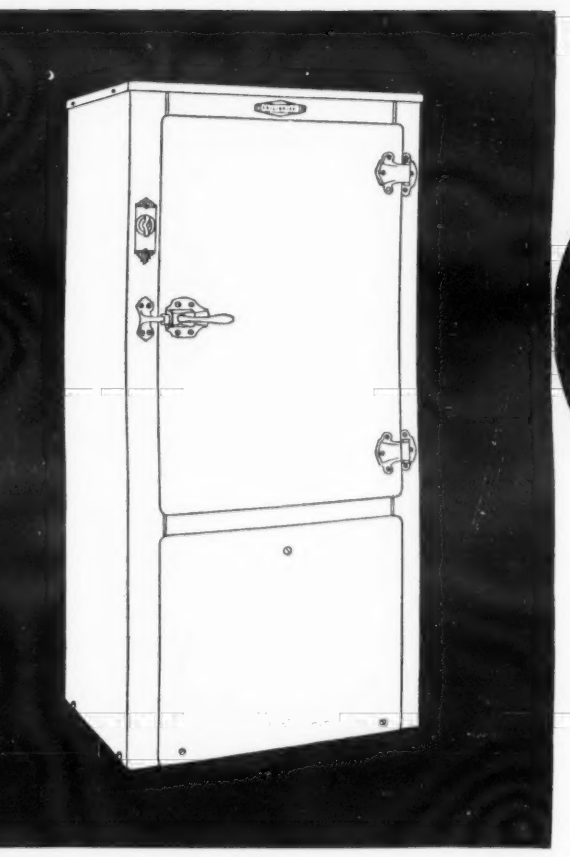
The nation welcomes the new low-priced, all Porcelain-on-steel Frigidaire

Newest Porcelain-on-steel Frigidaires are breaking sales records everywhere. Never before in the history of automatic refrigeration has it been possible to purchase all Porcelain-on-steel Frigidaires at so low a figure. Only Frigidaire's enormous production and the largest porcelain enameling plant in the world make such prices possible. Thousands of prospects are being turned into *immediate* buyers because of outstanding quality features, low prices and the liberal terms every Frigidaire dealer can offer.

Two other popular-priced models, G-5 and G-6

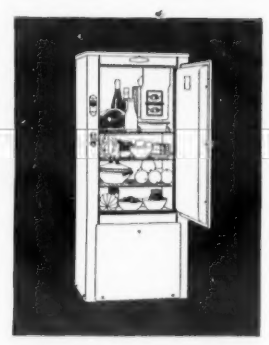
Following the enthusiastic reception of its first low-priced models Frigidaire Corporation has announced two larger models at popular prices to take care of the needs of larger families. . . . All four low-cost Frigidaires maintain the high Frigidaire standards of quality and all these cabinets have the following features:

1. Porcelain on steel.
2. Beautiful Cabinets.
3. The "Cold Control."
4. Elevated Food Shelves.
5. Quiet Operation.
6. Surplus Power.
7. High Speed Freezing Unit.
8. Lower Operating Cost.



G-3
$157.50
AT THE FACTORY

G-3—finished inside and out in Glacier-Gray Porcelain-on-steel. 4½ square feet of food storage area—freezes 24 ice cubes. Only $157.50 at the factory!

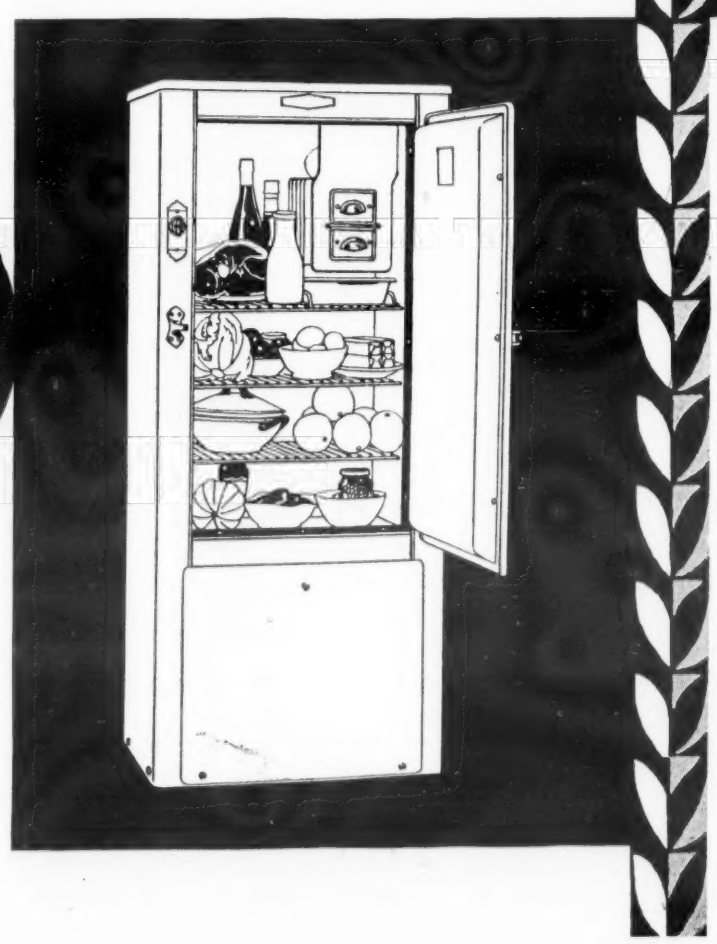


G-5 (at the left). One of the larger cabinets in the Greyline. This model has 8 square feet of food storage space, freezes 42 ice cubes and is finished inside and out in Glacier-gray Porcelain-on-steel. Only $185.00 f.o.b. Dayton, Ohio.

G-6 (at the right). The largest of the Greyne cabinets but the price is only $210.00, f.o.b. Dayton, Ohio. This cabinet has 9 square feet of food storage space, and like the other models, is equipped with the famous exterior "Cold Control."

G-4
$167.50
AT THE FACTORY

G-4—slightly larger than G-3—6 square feet food storage area—freezes 24 ice cubes. Finished inside and ou in Glacier-Gray Porcelain-on-steel $167.50 at the factory.



FRIGIDAIRE CORPORATION

SUBSIDIARY OF GENERAL MOTORS CORPORATION

DAYTON, OHIO

WATER AS REFRIGERANT SUBJECT OF DISCUSSION

(Reprinted from *Siebel Technical Review*, October, 1930)

"Refrigeration, in both the compression and absorption systems, is commercially produced by the evaporation of a volatile fluid such as liquid ammonia or sulphur dioxide. Because of the extended use of these two liquids, we commonly lose sight of the fact that heavier liquids including water can be employed in the same way, providing that a sufficiently high vacuum can be maintained for producing a high rate of evaporation at low temperatures. The possibility of employing water as a refrigerating medium has been a stock demonstration in college laboratories, but the difficulty of maintaining the sufficient high vacuum of 29.74 inches has always stood in the way of the practical development of the system, although the use of water as a refrigerant has very many attractive points for the small home unit.

"Water is non-poisonous, it is non-corrosive, it is cheap and easily obtained in the required degree of purity, and does away with a great deal of the service expense necessary with machines employing gases such as ammonia, sulphur dioxide, methyl chloride and others. The great difficulty experienced in ordinary cycles of operation experienced to date has been to develop a practicable pump with absolutely air-tight pistons and valves and shaft packing sufficiently tight to prevent the admission of air under the extremely high vacuum necessary for vaporizing the water at low temperatures. Oil packed vacuum pumps, such as the Geryk molecular pump and similar types, have been tried out in an experimental way, but have been found wanting from a practical point because of their cost.

"It is therefore very interesting to note the new type of water-evaporation system invented by Dr. Daniel F. Comstock, a prominent engineer of Boston, Mass., in which most of the former difficulties have been eliminated and which, by the way, avoids the use of any moving parts. So efficient is the new refrigerating system, that it is expected that it can be used successfully and economically for cooling small buildings and other duties that have been out of the province of the typical small electric refrigerating units now on the market.

"Starting with the evacuator, which corresponds to the compressor of the conventional system, we find that this vacuum-producing device is simply a Venturi type aspirator or "jet-pump," operated by a stream of fluid through a small nozzle. In the Comstock aspirator, mercury vapor is employed as the actuating fluid in such a way that the stream of vapor draws the water vapor after it by the principle of gaseous friction, thereby creating a higher vacuum in the cooling chamber than would be possible with the water jet now more commonly employed in laboratory aspirators or filter pumps. The mercury vapor is produced under pressure by a small boiler heated by a gas flame, hence there are no moving parts employed with the possible exception of the temperature control system. The water entrained with the mercury is compressed by the heavy mercury so that gravity returns the water to its former level and the mercury flows back into the boiler.

"By the employment of liquid columns to balance the pressure differences in the system, the circuit is effectively liquid sealed at the proper points so that the use of mechanically operated valves is avoided. After passing the aspirator, the mixture of water vapor and hot mercury passes to the cooling coils equivalent to a condenser, and here the two liquids are returned to their original condition after dissipating the heat to the atmosphere by air-cooling. Because the internal pressure of the system is always below atmospheric pressure, all danger of excessive pressures is avoided.

"By reason of the high vacuum created upon the water in the evaporator or cooling coils, the water evaporates at a very low temperature, just as liquid ammonia boils in the cooling coil of an ammonia evaporator. This produces the refrigerating effect that is proportional to the latent heat of vaporization of the water. It is exceedingly simple, and having no moving parts, requires no attention and can be operated at a minimum expense so far as labor and replacements are concerned."

DOUGLAS SHIFTED BY BENNETT CO.

Sacramento, Calif.—J. C. Douglas, formerly of San Francisco, has taken over the managership of the Sacramento branch of the L. H. Bennett Co., Ltd., located at 1212 K Street, distributors of the General Electric refrigerators. Douglas takes the place of William Rogers, who has been transferred to the San Francisco office. Douglas has been connected with the Bennett concern for two years and until now has been manager of the firm's coast wholesale division.

TAKES OVER REALISTIC FOOD SALES

New York, N. Y.—Sales and distribution of refrigerator food displays manufactured by the Realistic Food Products Co. of Newark, N. J., have been taken over by Realistic Sales Builders, 270 Madison Ave., New York City.

NEW BALTIMORE COMPANY

Baltimore, Md.—The Maryland Refrigeration Company, Inc., with headquarters at 516 North Eutaw Street, has been organized for dealing in refrigeration machinery. The incorporators are: John H. Frederick, John J. Murphy and Clinton T. Barnhart.

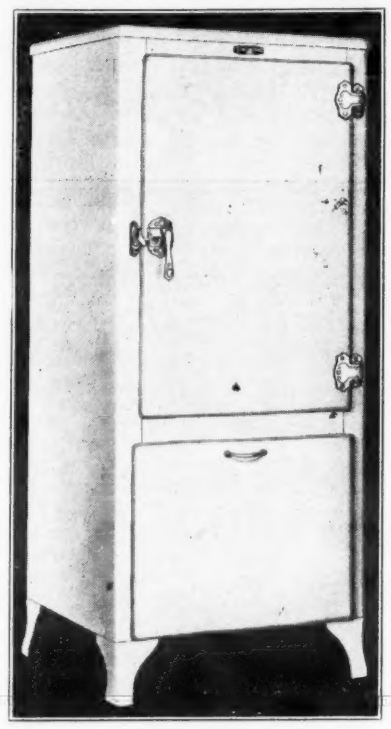
King Kold in the Field

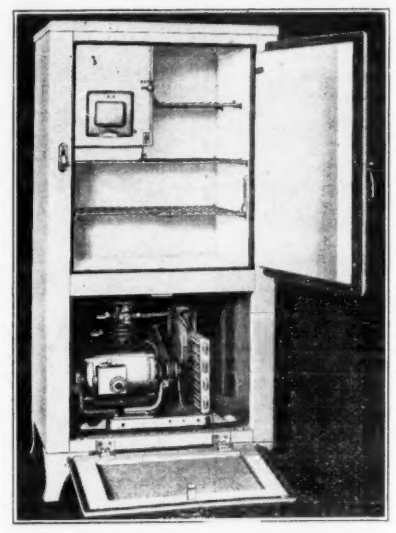
(Concluded from Page 1, Column 4)

a factory for the new King Kold machine. E. E. Glant is in charge of plant operations.

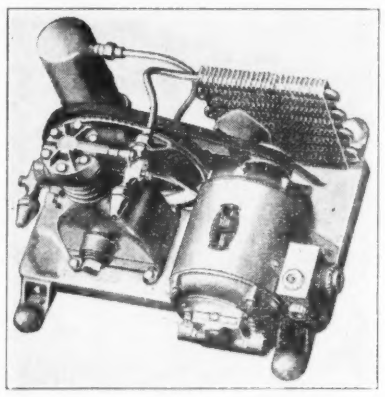
According to present plans, all servicing will be done at the factory. The unit can be removed by closing the valves and taking out one set screw.

On this page two King Kold models of the self-contained type are pictured. The compressor, which is compactly assembled, is installed in the base of the cabinet. Access to this compartment is via a door at the front.





Two of the cabinet models in the King Kold line are shown here. In the compressor, the compact assembly is the keynote.



FILTERS FOR BUFFALO'S NEW TERMINAL

Buffalo, N. Y.—Filtrine water coolers were recently installed in the post-office and restaurant departments of the New York Central Terminal, recently erected in this city. As the post-office is operated on a 24-hour basis, Filtrine high capacity coolers were required to take care of the large rush-hour requirements.

In addition to electric coolers, Filtrine style B filters were used for the entire drinking water system throughout the Terminal office building.

DEVENDORF GETS AGENCY FOR TWO CITIES

Flint, Mich.—The Flint agency for Copeland refrigerators has been taken over by the Fred Devendorf music house as an adjunct to the firm's musical instrument and radio business. E. J. Penny is sales manager of the refrigerator department.

The Devendorf house took over the local agency after buying the Shattuck Music House of Owosso, near here, which had the Copeland franchise in that city.

NEW JERSEY TELEPHONE EXCHANGES EQUIPPED

Newark, N. J.—The New Jersey Bell Telephone Company has completed a number of new buildings in which General Electric refrigerators and water coolers will be used.

In the Elizabeth building, two C-3's, one C-2, one CS-270, one CS-450 and one DP-3 have been installed. In the Newark building eight DP-3's are to be installed. In the Summit building, two DP-1's; in the Westfield building, two DP-1's; in the Radburn, one DP-1, and in the Livingston, one DP-3.

In the Vernon L. Davy Junior High School, East Orange, a CS-601, an ice cream cabinet and two DP-3's were installed.

YUKONS GET BIG SHOWING AT BALTIMORE

Baltimore, Md.—Considerable interest was shown in the new Kelvinator models on display at the eleventh annual appliance and Household Exposition held by the Consolidated Gas, Electric Light & Power Company, exclusive distributors for Kelvinator.

MAJESTIC'S ARRIVAL STOPS TRAFFIC

South Norwalk, Conn.—The Norwalk's Electric Store, 20 North Main Street, gained plenty of publicity with the first Majestic electric refrigerator to arrive in town. The refrigerator was uncrated on the sidewalk and the ceremony was witnessed by a crowd of such proportions that traffic was nearly forced to a complete standstill. The refrigerator was then moved to a display space in the store.

GLUECK LEASES ADDITIONAL QUARTERS

Kansas City, Mo.—Glueck & Co., General Electric refrigerator distributors, has leased a one-story building at 3719-23 Broadway, 90 by 80 feet, for its retail display room and home economics department, now located at 3310 Broadway.

G. E. OFFICIALS SPEAK TO WHOLESALE MANAGERS

Cleveland, Ohio—For the purpose of reviewing activities so far this year and outlining in detail plans for winter selling, approximately 50 wholesale managers from the central Great Lakes region attended the regional wholesale managers' conference at Refrigeration Institute, General Electric Company, held in Cleveland recently.

A. A. Uhalt acted as chairman of the conference. Speakers included T. K. Quinn, manager; P. B. Zimmerman, sales manager; M. F. Mahoney, assistant sales manager; A. C. Mayer, merchandising manager; W. J. Daily, sales promotion manager; W. E. Landmesser, commercial manager, all of the electric refrigeration department, General Electric Company, and Wm. Crawford, of General Contract Purchasing Corporation.

The meeting was marked by its optimistic spirit. A definite and workable plan was presented and accepted for the winter activity.

Left to right, sitting: A. A. Uhalt, Cleveland; A. G. Stratton, Cushman Refrigeration Co., Cleveland; C. E. Tracewell, The Willis Co., Akron; H. A. Turner, McCormick-George Co., Detroit; J. Houserman, Ochiltree Electric Co., Pittsburgh; F. E. Moniot, Ochiltree Electric Co., Pittsburgh; H. W. Cook, H. G. Bogart Co., Toledo; G. W. Fischer, H. G. Bogart Co., Toledo; C. H. Locke, H. G. Bogart Co., Toledo; H. G. Welfare, Cushman Refrigeration Co., Cleveland; D. W. Reid, Ochiltree Electric Co., Pittsburgh.

Middle row: W. E. Landmesser, Cleveland; L. P. Aurbach, Cleveland; G. M. Hooker, H. G. Bogart Co., Toledo; F. N. Wyatt, McCormick-George Co., Detroit; B. E. Trick, Hoosier Electric Refrigeration Co., Indianapolis; R. J. Hunt, Cushman Refrigeration Co., Cleveland; V. R. Washburn, Bard-Barger, Inc., Columbus; J. L. Bouton, H. G. Bogart, Toledo; E. T. Bogan, Cleveland; G. Matick, Ochiltree Electric Co., Pittsburgh; John G. Sorg, Erco, Inc., Buffalo; Earl Norling, Cleveland; G. E. Brothers, Ochiltree Electric Co., Pittsburgh; A. C. Mayer, Cleveland; Paul Dow, Cleveland; E. H. Potter, H. G. Bogart, South Bend, Ind.

Top row: H. B. Shaughnessy, H. G. Bogart, Toledo; Malcolm Bard, Cleveland; H. S. Brown, Canadian General Electric, Toronto; Charles Wagner, Cleveland; O. J. Purcell, H. G. Bogart, Toledo.

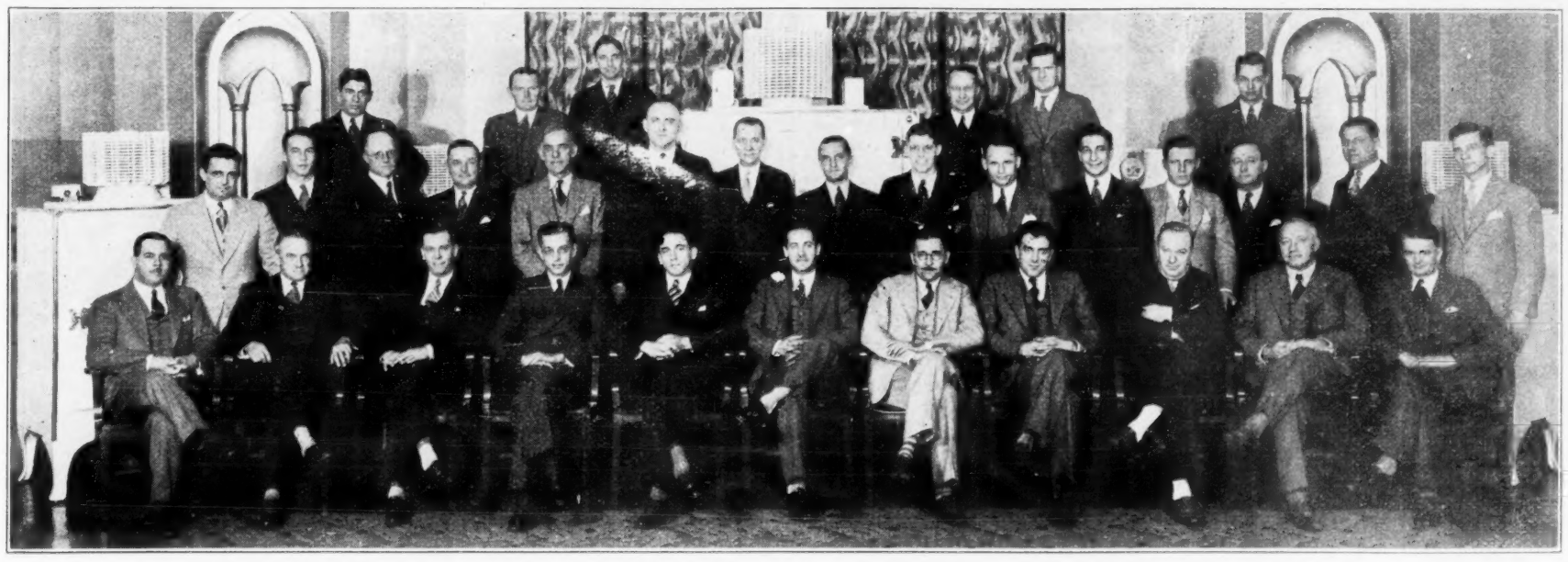
MAJESTIC READY ALONG TOLEDO FRONT

Toledo, Ohio—The Toledo branch of the Majestic Distributing Corporation of Cleveland entertained more than 150 Majestic refrigeration and radio dealers at a dinner in the Hillcrest Arms Hotel, October 23. Following the dinner the dealers assembled in the Hillcrest Auditorium where talks on Majestic refrigeration and radio products were given by George Corneil, refrigeration engineer of the Grigsby-Grunow factory, and Fred O. Partridge, factory representative.

Toledo has always been known as the hot-bed of refrigeration on account of the keen competition, and the Majestic men have their hats in the ring. They are planning to make this fall a profitable one, especially in refrigeration.

Others who spoke were Dan J. Nolan, president; R. R. Myers, general manager, and E. H. Hoezele, publicity director of the Majestic Distributing Co., and Don Millar, local manager.

Increased Winter Selling, Their Goal



General Electric Wholesale Managers in the Great Lakes Region Gather for Discussion of Winter Selling Problems.

Selling Electric Refrigeration In Conservative New England

By J. E. Bullard

IN the little historic city of Concord, Massachusetts, Austin D. MacRae is doing a good electric refrigerator business considering the size of the city. In many respects it is not so easy to sell such a specialty in a small city as in a large one. For one thing it is out of the question to organize as large a sales force that is directed by an experienced, intelligent and highly efficient sales manager. Mr. MacRae, however, does have one man whose specialty is selling refrigerators. He is the refrigerator salesman.

It is not easy to classify the business establishment of Mr. MacRae. Starting in business as a plumber he has branched out until now he does plumbing and heating, sells electrical appliances and does electric wiring, pushes the sale of an oil burner and sells both compressed gas and appliances and city gas appliances. His store is located in the heart of the shopping district in a building on the site of the old grist mill which attracted the British soldiers to Concord on April 19, 1775. This store is one of the most attractive ones in the city, with well kept windows and displays of appliances on the store floor. In all advertising matter it is called a store and not an office or a display room. It is a place in which goods are sold rather than merely shown.

The local newspapers are used for advertising, an advertisement usually appearing in each issue of each paper. The name Frigidaire appears on the letterheads of the firm as well as on the electric sign above the store door. No opportunity is missed to keep this name before the public in connection with the firm name.

Each Salesman Specializes

The salesman works on a commission basis and specializes on refrigerators, although he can sell other products handled by the firm if desired. Mr. MacRae has found from experience that it is better to have each salesman specialize and with a total of fourteen persons on the payroll had four outside salesmen during the summer of 1930. One of these was the Frigidaire salesman, one the oil burner salesman, one the tank gas salesman and one the city gas salesman. He has found that better results are obtained in this way than by having all the men try to sell all the appliances and not specializing on any one thing.

Where each man is specializing on one thing he makes more sales and is also able to close sales in the case of prospects that the other men find and are not able to close because they do not know the sales arguments well enough.

Direct mail matter is used extensively. Rarely is there a week during which something in the way of direct mail matter is not sent out in one way or another. In some cases it is literature supplied by the manufacturer, but usually there is a mimeographed letter enclosed.

In order to simplify the use of circular letters, Mr. MacRae has a mimeograph machine and an addressing machine in his store. As it is not necessary to go to Boston or some other city larger than Concord to have duplicating done and as it is a matter of but a few minutes to make a stencil, and a few more minutes to run off a few copies on the machine, letters are used much more extensively than otherwise would be the case.

Large Mailing List

These letters are made to fit the requirements at the moment. The mailing list varies with the particular letter that is mailed. In the case of gas appliances when the city was getting a gas supply for the first time in the spring and early summer of 1930, a mailing list of 1,500 was used. In other cases, the list may be confined to the prospect list of the salesman. The list of 1,500 included virtually every family in the closely built up section of the city. Concord itself is a small city, but there are many other communities near by which are reached by Mr. MacRae.

The letters used tie up with the efforts of the salesman. For example a letter will take the following form. "We thank you for the interview granted our Mr. Brown when he called on you recently in regard to electric refrigeration. We have on display at our store several models of Frigidaire refrigerators and you are invited to call and inspect them at any time."

After this introductory paragraph will follow the sales arguments that conditions indicate will prove most effective. Letters are also used to pave the way for the salesman.

A letter will go out to a list of prospects on whom the salesman is to call and these letters will state that a salesman will call in the near future and will give his name. Advantages of electric refrigeration will be mentioned in this letter and the desirability of making a purchase pointed out. In all letters the prospect is invited to visit the store and inspect the merchandise that is on display.

In New England especially, this form of sales effort proves very much worthwhile. It is a real help to the salesman, as it gives him an introduction and there are so many salesmen calling at the homes and so many cases where a man representing himself as a salesman gets into a house and perhaps even collects money when he is not representing any firm but merely taking this method to get money in an easy way, that many housewives are extremely cautious.

Paving the Way

With the introductory letter preceding the salesman and giving his name, many an interview is made possible that it would be difficult if not impossible to make if no such letter was mailed. When an order is secured a letter is mailed thanking the person for the order. At all times the firm keeps in close touch with all customers and all prospects through the mail.

Mr. MacRae is convinced that this not only results in more sales but also that it enables him to attract better salesmen and keep them longer than would be the case if he made less use of letters in assisting his men. It is hard enough to find really good salesmen to work on a commission basis anyhow. One concern employing a normal force of ten men has but one man who has been selling electric refrigerators for ten years and has continued with this firm ever since it took over the sale of this make of machine. The number of salesmen fluctuates from as low as four to as high as fifteen. Another concern that through advertising and searching for men in other ways succeeded in getting together a force of fifteen salesmen found itself with no good men after a couple of months and in the position of starting all over again. Such experiences as these are only too common in the New England districts.

Conservative Buyers

This is a difficult section of the country in which to make sales of anything that is new and runs into a considerable sum of money. The average wage and the average salary paid in New England is lower than that for the country as a whole. The people are inclined to be ultra-conservative. The conservatism of Concord, Mass., is indicated by the fact that though it is one of the oldest communities in the United States and was so important in 1775 as to lead the British to march upon it, there was no city gas supply till 1930. It required 118 years use of gas before this city was convinced that it was an essential thing for a city its size. In such a city it can be seen that sales resistance is none too easy to overcome. Hence the use of every possible means of overcoming it and of assisting the salesmen wherever and whenever they can be assisted.

The apartment house is something that is not seen in Concord. The people live in one or two-family houses set well apart and surrounded by lawns. It is a typical old New England community with more than the usually historical background and the maximum of conservatism.

Counting the three people who are in the office and who devote at least a part of their time to selling to those who come into the store, and the four outside salesmen, we find that Mr. MacRae has just half of his entire force giving all or part of their attention to selling. This is a large proportion and is not always maintained but does show that to get business in a small conservative city in New England it is necessary to get out and do real selling rather than to wait for the people to come in and make purchases.

MAJESTIC NOW IN THE OMAHA FIELD

Omaha, Neb.—The new Majestic refrigerator is at last on display in Omaha. The R. S. Proudfit Co., of Lincoln, are general agents for the territory including all of Nebraska, nine counties in southwestern Iowa and eighteen counties in northeastern Kansas. P. E. Thompson, 1007 Howard Street, Omaha, will be the representative for the city of Omaha and immediate territory.

Mr. Thompson announces that the Hospe Co., Hartman Furniture Co., Hodge Electric Co. and Glen Crancer are now handling the Majestic electric refrigeration in Omaha. In addition to these, the Brandeis Stores, Orchard & Wilhelm and the Union Outfitting will push the Majestic. All three have previously sold other makes.

Majestic held a service school for two days at the Hill Hotel, Omaha, for all sales stations in the Nebraska territory. Fifty agencies were represented and the attendance was more than one hundred.

WITH WESTINGHOUSE IN CONNECTICUT

New Haven, Conn.—Connecticut Electric Refrigerating Company, Inc., 149 Temple Street, state distributor for Westinghouse refrigerators, has appointed the firm of Community Service, Inc., as Lakeville and Salisbury dealer. This is the fourteenth dealership named in the Connecticut field, not counting the home office here and the branch at Hartford.

ELECTROLUX ON COAST

Seattle, Wash.—Wedgewood Courts, of Queen Anne, Seattle, has installed Electrolux refrigerators. Each apartment in the new building has an Electrolux. There are seventy individual apartment suites.

Contacting Mr. Fish

Harrisburg, Pa.—On the premise that a little play now and then helps refrigerator sales, N. K. Ovalle, General Electric refrigerator distributor, recently took department heads of his organization on a week-end trip, perhaps the last of the season. The net results of the trip were not made known.

Those in the party included: (Front row)—W. M. Welch, manager of the Lebanon branch; R. J. Madigan, commercial specialist; H. C. Will, assistant general sales manager; N. K. Ovalle, president and general manager; L. D. Wasson, sales supervisor of major operations; Keith Allen, commercial specialist. (Back row)—W. R. Withers, commercial specialist; C. K. Johnston, commercial supervisor, and W. M. Hutchison, sales promotion manager.

Majestic Staff Takes to Wheels

Roycrafters With Their Fleet.

Minneapolis, Minn.—The wide open spaces of Minnesota and North Dakota mean very little to the dealer contact men of the Roycraft Corporation, Majestic distributors for those states. To push the sales of Majestic radios, the field staff took to wheels and as a result close touch was maintained with dealers. These same tactics are being employed to put the new Majestic electric refrigerator over in this territory.

Nearly all dealers operating under the Roycraft Corp. have been sampled. The entire sales force of the distributor and dealers spent two days at the big plant in Chicago recently, during which time complete instruction and information about the refrigerator were eagerly absorbed by the Roycrafters.

The following members of the staff are pictured here: Darwin L. Dale, in charge of dealer publicity; J. L. Baasen, dealer sales promotion department; Phil Carney, field service; Lee Jett, field service; George Boll, H. L. Cooperman, Matt Hegerle, Jack Condon, I. F. Gardner, Theodore Roberts, Harry Dillon, Harry Frishberg, R. J. O'Brien, all salesmen, and J. W. A. Henderson, territory supervisor for Grigsby-Grunow.

REFRIGERATION TAKING STRONG HOLD IN MEXICO

Mexico City, Mex.—Intensive pioneering work that has been done during the past five or six years has made Mexico a most promising field for electric refrigeration. The people of this country are now refrigeration conscious. Although the purchasing public of this country is rather limited in proportion to the Republic's population, for of the 16,400,000 inhabitants only about from fifteen to twenty per cent may be said to possess buying power. Nevertheless, residents of Mexico who are in the purchasing power class are alive to the advantages of things that save time, increase comfort and make life more pleasant. Refrigerator salesmen regard all persons who own an automobile as live prospects. The buying of a motor car and its maintenance in this country requires quite a good deal of money. But, considering the comparatively small number of people in the purchasing power class, Mexico is said to be one of the richest lands in the world, in point of the number of automobiles that are owned and used.

Pioneering Efforts

The cultivation of the refrigeration market was a rather long and laborious process. At the initiation of the campaign, electric refrigeration was practically unknown in this country. At first, sales resistance was quite strong. But the campaigners went about their job in the right way. Judicious newspaper advertising, backed up by a series of direct mail literature to carefully selected lists of prospects, worked wonders. These methods reduced sales resistance and the barriers of what might be styled a natural prejudice against "something new." In the beginning little if anything could be done with retail salesmen. But now it is different. Retail sellers are doing very well in this field. Many Mexican men and women have been taught the art of selling electric refrigertion and a number of them have made good progress. The Mexican General Electric Company conducts sales schools, and the results are most satisfactory.

The increasing popularity and demand for electric refrigerators have been assisted to a remarkable extent by government regulations that modern methods of sanitation and cold storage be installed in all places where food, drinks, medicines, etc., are kept and vended. More and more drug stores, hospitals and health departments are being equipped with electric refrigerators for the storage of vaccines, serums, etc. Enterprising hotel managers have been quick to realize the advantages of water coolers in a country that has a warm climate and practically all apartment houses now under construction are being arranged for the installation of refrigerators. In most of the residences, the refrigerator is situated in the "patio" (courtyard) and invariably is equipped with a good strong padlock. This safeguard is necessary as pilfering of food by servants is rather prevalent.

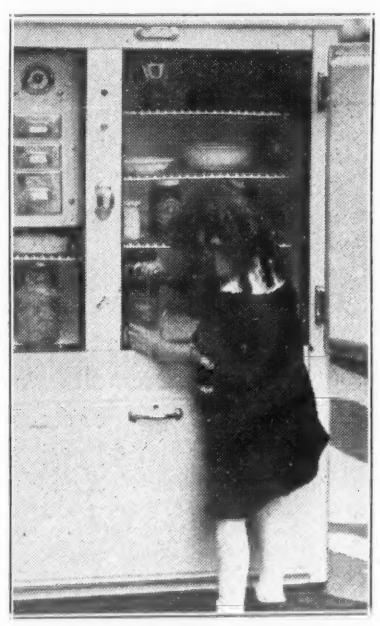
Large indoor amusement centers are also becoming important users of electric refrigerators. "Fronton Mexico" here, the largest place in the world featuring the Spanish version of handball, has been equipped with electric refrigeration for the storage of champagnes, wines and beer sold to its patrons. Several theatres are considering the installation of water coolers.

Overcoming Barriers

House-to-house canvassing is next to impossible in this country, as various social upheavals in the past have made most persons loathe to admit strangers to their homes, and many householders do not care about discussing business with salesmen on the veranda or doorstep. However, skilfull newspaper publicity, supported by judicious direct mail to live prospects, is making the approach of the salesman easier. Clever window displays and other forms of advertising are also doing much to expand the interest of the prospect to the buying point.

The volume of applications for installations received from commercial enterprises and apartment houses in the capital and the large provincial cities prove that business in Mexico is indeed good for electric refrigeration.

Caught in the Act



This young Syracuse miss finds the Copeland in her home a good companion especially when she comes home from school. The photographer caught the young miss in the act of relieving the Copeland of some of its contents.

TWENTY FOR WILSON

Miami Beach, Fla.—J. O. Wilson, salesman for the Miami Electric Refrigeration Co., General Electric refrigerator dealers here, has closed an order for twenty S-42 General E'ectric refrigerators for installation in the Hiawatha Apartments.

SURE OF A COLD DRINK

Leavenworth—The Colored Detachment Club has been assured of a good cold drink at any time by the installation of a G. E. water cooler, model DP 3, Kansas City, made the sale.

OFF-SEASON LINES KEEP BOSTON SALESMEN BUSY

Boston, Mass.—Armistice Day last year saw the start of a new business firm, the Appliance Engineering Co., in this city. With Servel electric refrigerators, Fowler oil burners, and several makes of radios to distribute, this company started from scratch. Not a single dealer or experienced salesman did it have.

Today some 300 dealers, augmented by service, office, delivery, and wholesale corps, belong to the organization. Most of the dealers began with refrigeration only, but they soon found that the sale of a Servel opened the door for the sale of a Fowler, and now a large percentage of the group handles both products.

"Neither electric refrigeration nor oil burners can profitably stand on their own feet without a partner industry to fill in the seasonal gap," maintains E. A. Terhune, general manager of the Appliance Engineering Co.

"For several years," he says, "I was sales manager for the New England Frigidaire distributor. In that job I saw a good many retail salesmen sacrificed because they tried to make a living in refrigeration alone. Factories and distributors can pull through from one season to another, but the retail salesman who must operate on a commission or the equivalent has not one chance in ten of success.

"Just as truly as refrigeration and oil burners are mated," continues Mr. Terhune, "so are little oil burners and the automatic furnace burner conjugal. Too many distributors and dealers are missing the golden opportunity presented by range burners because they see only the larger item of sale in the power burner, and forget that Woolworth made a fortune from nickels and dimes.

"We find the range burner business to be the bread and butter which builds up the oil burner and even refrigeration business in the off season. As distributors we are extremely interested in building a permanent organization, and we find that the combination of refrigeration and oil burners makes it possible for us to keep very good men in the field earning a satisfactory income 12 months in the year. With only one line we would find it necessary to take lower-priced men."

TO HANDLE CARBONDALE AFFAIRS IN CONNECTICUT

South Norwalk, Conn.—William H. Sniffen, of this city, has been appointed sales manager for Connecticut by the Carbondale Ice Machine Company.

EVANS ADVANCED TO VICE PRESIDENT BY KELVINATOR

Detroit, Mich.—The advancement of Works Manager G. M. Evans to the position of vice-president in charge of manufacturing has been announced by George W. Mason, president of Kelvinator Corp.

Mr. Evans is a graduate of the College of the City of New York, and of Cornell

G. M. Evans

University, with degrees of mechanical engineer and electrical engineer. Prior to joining Kelvinator he had been associated with the General Electric Company at Schenectady, N. Y.; consulting engineer with the Fuel Engineering Co., New York; general manager for the Budd Wheel Corporation, and superintendent of planning for the Chrysler Corporation, Detroit.

EASTERN DAIRIES HELP SALES OF MILK COOLERS

Bridgeport, Conn.—The L. M. Reed Corporation, 347 Fairfield Avenue, Copeland distributor for Fairfield and Litchfield counties and part of New Haven county, has developed a large volume of business in milk-cooling equipment through a special co-operative sales plan in which the dairies aid by encouraging their milk producers to invest in the equipment at a saving.

The plan was developed by Merwin A. Pond, general sales manager, and William B. Sanderson, in charge of refrigeration for the Reed Company, when both were connected with the New Haven Electric Company, Southern New England distributors for Copeland. The principle of the co-operative arrangement is that by material reduction of sales cost and overhead through volume, a rebate to the milk producers is made possible.

Dairies participating in the plan, while not benefiting from the rebate, all of which goes to the farmer or producer, do derive an advantage through the fact that they are made sure that all milk delivered to them by the equipped producers has been properly cooled. Inadequate cooling by the producer has been one of the major problems facing dairies.

Under the arrangement perfected by Mr. Pond, the dairies send a circular letter to all producers not equipped with coolers, suggesting the purchase of Copeland equipment and listing prices and terms, with the rebate, under which it can be obtained.

Inasmuch as each large dairy has as many as two to three hundred producers, the field is enormous, Mr. Pond points out. Many of these producers are potential prospects for cooling cabinets. Agreements on the co-operative plan have recently been placed in the hands of the following dairies: R. F. Worden & Sons, Waterbury; A. H. Merriman & Sons, Waterbury; Mitchell Dairy, Bridgeport; Round Hill Dairy and Foland's Dairy, Bridgeport. The response to the plan has been entirely satisfactory, with many of the producers acquiring the equipment.

BIG SEND OFF ACCORDED MAJESTIC IN LOUISVILLE

Louisville, Ky.—The Cooper-Louisville Company, 430 East Broadway, distributors for Kentucky, southern Indiana and southern Illinois, announced the Majestic refrigerator in a full page advertisement in the Sunday papers, Oct. 26.

J. E. Johnson is president of the Cooper-Louisville Co., also distributors for Majestic radios in the same territory. According to the sales manager, S. J. Rapier, the firm plans extensive distribution through dealers. Between seventy-five and one hundred agents will be appointed, with seven field representatives traveling throughout the state.

Among those dealers already selected in Louisville are: J. Bacon & Son, one of the city's oldest department stores; Joseph Lang, furniture store, 515 East Market Street; Acme Electric Co., Fourth and Oak Streets; Swartz Dry Goods Company, Spring Street, Jeffersonville; Fourth Avenue Sales Company, Majestic dealers, 628 Fourth; Chiquelin Radio Company, 1587 Bardstown Road; Charles Stauble & Son, 1806 Frankfort Avenue, hardware dealers; Greenfield Majestic Shoppe, 2250 Shelby Street, and Roy E. Will, garage, 1130 Goss Avenue. All Louisville Majestic dealers co-operated with the distributor in page advertisements announcing the Majestic refrigerator.

SEEGER PUTS KEELY IN CHARGE OF CHICAGO AREA

Chicago, Ill.—L. C. Keely has been appointed as district manager in Chicago for the Seeger Refrigerator Co. of St. Paul, Minn. He will make his headquarters at 1602 Builders Bldg., 228 North LaSalle St.

L. C. Keely

Mr. Keely is well known in the refrigeration industry, having been sales manager for the Zerozone Corporation of Chicago.

FIELD STAFF ADDED

Newark, N. J.—Realistic Food Products Co., 266 Fabyan Place, manufacturers of line of artificial foods, has appointed as special representatives A. R. Giard & Associates, 563 Grafton St., Worcester, Mass., in charge of New England territory; R. C. Lee, c/o Cambridge Hotel, Seattle, Washington, in charge of Washington, Idaho and Montana; G. R. Pizarro, 1519 West 7th St., Los Angeles, Calif., in charge of California, Oregon and Nevada; R. R. Williams, 207 South Jennings St., Anthony, Kansas, in charge of Kansas, Oklahoma and Missouri.

THATCHER NOW MANAGER OF N. Y. FACTORY BRANCH

New York, N. Y.—W. F. Thatcher has been appointed manager of the Kelvinator New York branch.

After graduation from Cornell University in 1913, Mr. Thatcher joined the Union Carbide and Carbon Corporation as sales engineer. In 1919 he became general manager of all the Canadian

W. F. Thatcher

companies of Union Carbide and Carbon, including supervision of sales of products manufactured by Dominion Oxygen Co., Prest-O-Lite Co. of Canada, Union Carbide and Oxweld Acetylene Co. In 1923 he returned to New York as assistant to the president of several subsidiary companies of the holding corporation.

Mr. Thatcher was formerly executive vice-president of Servel, Inc.

TOLEDO MEN INTERESTED IN COMMERCIAL MARKET

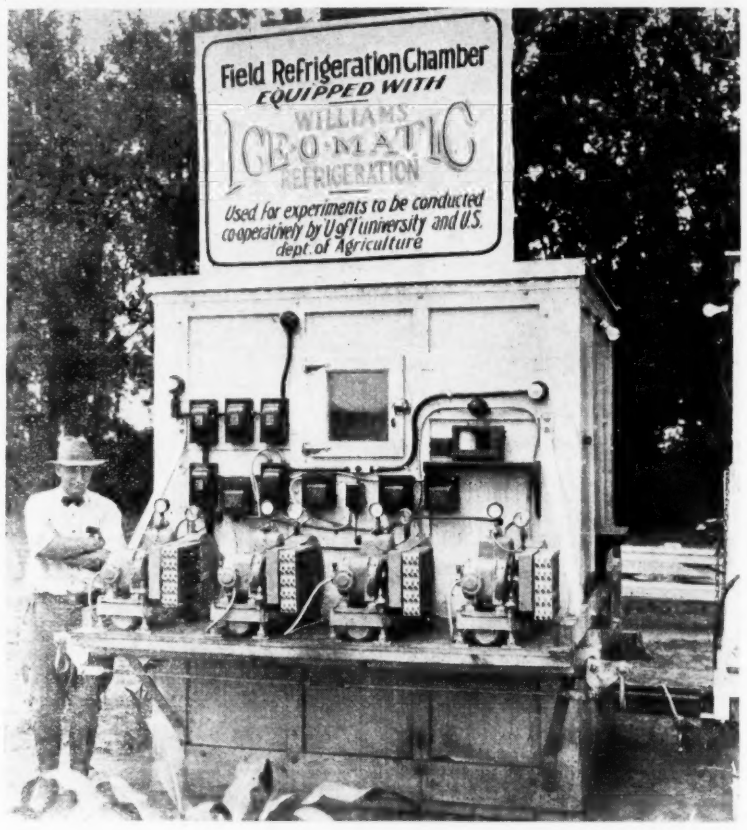
Toledo, Ohio—Recognizing the potential market for electric refrigerators for schools, hospitals, restaurants, grocers, and others, the Toledo Edison Company is planning increased activity in the commercial field.

Recently four members of the company's commercial refrigeration sales division spent a day at headquarters of the electric refrigeration department, General Electric Company, in Cleveland, to discuss commercial refrigeration activities. At this meeting they stressed the vast market opportunities for the sale of commercial bodies. Attending the session from Toledo were H. C. Bennington, J. N. Bolton, C. T. Day, and C. R. Honafins, of the Toledo Edison; H. G. Bogart, Toledo distributor for General Electric refrigerators; W. E. Landmesser, commercial manager for the electric refrigeration department, and H. T. Hulett, of the commercial division.

FILTRINE FOR NEW PENNSY STATION IN PHILADELPHIA

Philadelphia, Pa.—The new Pennsylvania railroad terminal, just completed, will have Filtrine filters with each water cooler. Up to the present time there have been some 48 filters installed.

Cold Tests in Corn Field



Bloomington, Ill.—Research work in the corn fields is making valuable use of electric refrigeration in testing hardiness or ability of certain kinds of corn to withstand low temperatures. Eugene D. Funk, president of the Funk Brothers Seed Company, and owner of 20,000 acres of farm land in and about Bloomington, has devoted considerable time to breeding of corn.

To bring about low temperature for testing the hardiness of corn, Mr. Funk had the Williams Ice-O-Matic engineers design suitable equipment for the experiments. The refrigerated chamber, with its battery of four Ice-O-Matics has been maneuvered about the corn fields near Bloomington for the accurate cold tests.

A bottomless box is used in the specially constructed outfit for the experiments. This box may be lowered over four hills of corn to produce artificial frost, or bring down the temperature to the degree desired.

Some strains of corn cannot survive low temperatures and are killed at 40 degrees Fahrenheit, while others stand up easily when exposed for several hours at temperatures well below freezing.

TIMKEN-DETROIT ADDING REFRIGERATION DEALERS

Detroit, Mich.—So convinced is the Timken-Detroit Co. that it is necessary for a good specialty selling organization to handle oil burners that exclusive dealers are not granted the Timken franchise.

After taking over the entire oil burner manufacture and sales of Socony in 1928, the Timken-Detroit Company has proceeded slowly in developing distribution, taking heed of the bones of defunct oil burner concerns bleaching in the desert of over-expansion.

Extreme care in choosing sales outlets has been the guiding policy. Up until this year factory sales branches handled the entire output. Now dealers who have demonstrated ability to sell one specialty are considered for the franchise. Among these are several electric refrigeration dealers.

"Electric refrigeration and oil burners present the same sales methods and sales problems, the same prospects and clientele," says T. A. Crawford, the Timken sales promotion manager.

One fly in this sales hook-up ointment, Mr. Crawford thinks, is the fact that the sales peak of the two products tend to overlap, or at least to adjoin. May, June and July are the big refrigeration months; whereas August, September and October (with top sales arriving about Sept. 25) are peak months for oil burners.

"This situation is neither right nor logical," says Mr. Crawford. "Refrigerators are sold when needed most. The same situation should be found in oil heat selling. If dealers would only have the nerve to push their oil burner lines—and electric refrigeration men are the type who would—in the winter months, the peak load would be distributed more evenly. The oil burner would then become an ideal sales companion for the electric refrigerator."

Among the Timken dealers who are also merchandising electric refrigerators successfully, Mr. Crawford lists Donald Blakslee, Inc., of Patchogue, N. Y. This concern, although 70 per cent of its sales are of oil burners, is also deriving good revenue from G. E. refrigerators and weather stripping.

Two new Timken dealers in Michigan, the A. W. Shields Sales-With-Service Co. of Lansing, and the Gothman Sales Co. of Jackson, are combining Timken oil burners, Copeland refrigerators, and the General Motors radio.

Other Timken outlets which have been making considerable progress with electric refrigeration as well are the Laube Electric Corp. of Rochester, N. Y.; Baird Swannell, Inc., of Kankakee, Ill.; H. A. Houston, Jr., of Pontiac, Mich., and Modern Necessities, Inc., of Nyack, N. Y.

AUTUMN BUSINESS GETS GOOD START

Stockton, Calif.—L. H. Bennett Co., Ltd., 14 South Sutter Street, Stockton, distributors of General Electric refrigerators, reports that the autumn pick-up in business is in full swing. Among the installations during the past few weeks is the $3,000.00 installation of G. E. water coolers in the Stockton plant of the Fibreboard Products Company. Recently the Stockton office installed four household type G. E. refrigerators in the Yosemite Valley in the cottages rented to vacationers.

The other branches of the L. H. Bennett Company—in San Jose, Palo Alto, Burlingame, San Francisco, Oakland, and Sacramento—likewise report good business.

NEW COPELAND OUTLETS

Mt. Clemens, Mich.—The Copeland Sales Company announces the appointment of two new distributors to handle Copeland refrigerators: Lindeman-McFadden in Greensboro, N. C., and the Bomar-Summers Hardware Company and affiliated companies in Louisville, Kentucky.

APARTMENT HOUSE JOBS BOOST SALES IN MIAMI

Miami, Fla.—The Domestic Refrigeration Co., Inc., Frigidaire dealers, is at work on a number of apartment houses on Miami Beach, making Frigidaire installations. In the Neham Apartments four AP5 units were placed. The Bow Apartments will take 12 G-5 units. In the Gulf Stream Apartments five AP6 machines, and in the Locus Apartments 28 AP-4 units are being installed.

The Frank Apartments, at S. W. 5th Street and 9th Avenue, is being equipped with Frigidaires by the local dealers. The contract calls for installation of 11 G-4 and one AP-5 units.

The Granada Apartments, last of the group of apartment buildings in the Fort Dallas section of Miami, is being equipped with G-5 Frigidaires.

The other apartments in the group were equipped with Frigidaires last season. It took 58 units for the Granada job, and the installations were made by the Domestic Refrigeration Co., Inc.

The Table Supply Stores of Miami, dealers, as their name would indicate, in groceries and provisions, have just had their four stores equipped with Frigidaires.

TEMPRITES IN COLOR FOR ST. PAUL JOB

Detroit, Mich.—The Liquid Cooler Corp. has just received an order for eleven Model 120 Temprite wall fixtures for a multiple installation in a new office building of the Northern States Power Co., St. Paul, Minnesota.

The Model 120 Temprite is a hand-modeled pottery fixture in which the cooling unit is installed. For this particular installation the coolers are finished in black to harmonize with the other fittings and building equipment.

REFRIGERATION PATENTS

ISSUED SEPTEMBER 16

1,775,749—METHOD AND SYSTEM FOR VENTILATING AND ATTEMPERATING AUDITORIUMS AND THE LIKE. Willis H. Carrier, Essex Fells, N. J., assignor to Carrier Engineering Corporation, Newark, N. J. Filed June 22, 1927. Serial No. 200,665. 26 Claims. (Cl. 98—33.)

1,775,989—REFRIGERATING APPARATUS. French E. Dennison, Beloit, Wis., assignor to National Refrigeration Corporation, Beloit, Wis., a Corporation of Delaware. Filed Aug. 4, 1927. Serial No. 210,546. 8 Claims. (Cl. 62—116.)

1. In a refrigerating apparatus, the combination of a refrigerating cabinet provided with a cooling compartment, an evaporating element centrally disposed in said compartment, and partitions separating the evaporating element from the cooling compartment and forming an evaporating compartment, the cabinet being also provided with an ice compartment separated from the cooling compartment and communicating directly with the evaporating compartment.

1,776,235—REFRIGERATION METHOD AND APPARATUS. Lester U. Larkin, Atlanta, Ga. Filed June 28, 1928. Serial No. 228,824. 31 Claims. (Cl. 62—85.)

24. In combination with an evaporating tank, a pipe loop connected at its ends to said tank and having parallel limbs extending substantially horizontally, and thin sheet metal heat absorbing fins extending perpendicularly to said limbs and in heat absorbing contact with at least one of said limbs.

ISSUED SEPTEMBER 23

1,776,307—WATER COOLER. Jose Vidal Bosque, Santiago de Cuba, Cuba. Filed Dec. 10, 1928, Serial No. 325,026, and in Cuba Nov. 30, 1928. 2 Claims. (Cl. 225—40.)

1,776,401—REFRIGERANT CONTROL. Harry E. Thompson, Detroit, Mich., assignor to Universal Cooler Corporation, Detroit, Mich., a Corporation of Michigan. Filed Nov. 2, 1927. Serial No. 230,582. 6 Claims. (Cl. 236—99.)

1. A refrigerant control device for refrigerating systems of the direct expansion type, comprising an expansion valve of the type having a movable throttling member, a plunger for actuating the same, an expansible member separating the plunger and throttling member, and a thermostatic unit having an expansible member positioned within a housing and adapted to contact with one end of said plunger, said housing being closed whereby any displacement of fluid takes place solely between said housing and said first named bellows member.

1,776,451—REFRIGERATING SYSTEM. George Richards, Chicago, Ill., assignor of one-half to Alex Rassogianis, Chicago, Ill. Filed Apr. 27, 1928. Serial No. 273,177. 7 Claims. (Cl. 62—101.)

1. In combination, a relatively long refrigerating cabinet having a brine compartment therein, food containers projected in said brine compartment, a cooling coil within said brine compartment, an ice cream freezer, a brine compartment within said freezer, means for establishing communication between said brine compartment of said cabinet and the brine compartment of said freezer, and means for causing the brine from said brine chamber in said cabinet to circulate through said freezer.

1,776,483—BRINE COOLER. George Hall White, Washington, D. C. Filed May 14, 1929. Serial No. 363,073. 2 Claims. (Cl. 257—35.)

1. A brine cooler, including a brine receiving casing having a lower inlet and an upper outlet, upper and lower headers arranged in the casing and defining upper and lower ammonia chambers, ammonia tubes within the casing opening through the headers, the ammonia tubes opening through the upper header extending appreciably above said header, deflecting tubes in the upper ends of said ammonia tubes and extending into the upper ammonia chamber, said deflecting tubes co-operating with the ammonia tubes to direct the ammonia from the upper ammonia chamber into the ammonia tubes and in a thin film lengthwise said ammonia tubes, means for maintaining a constant ammonia level in the lower ammonia chamber, means for transferring ammonia from the lower ammonia chamber to the upper ammonia chamber, and means for directing the gases from the upper ammonia chamber in condensed liquid form to the lower ammonia chamber.

1,776,744—REFRIGERATING PLANT. Ivar Amundsen, Oslo, Norway. Original application filed Oct. 29, 1926, Serial No. 145,037, and in Norway Jan. 28, 1926. Divided and this application filed Sept. 29, 1927. Serial No. 222,849. 1 Claim. (Cl. 62—118.)

Refrigerating plant of the absorption type comprising a condenser, an evaporator and a collecting vessel for the condensing refrigerating medium located between the condenser and the evaporator, a conduit affording the sole avenue of communication between the collecting passage and the evaporator, a single check valve opening toward the collecting vessel arranged adjacent the bottom of the collecting vessel, said valve being opened by the pressure in the evaporator when the ratio between the pressure in the evaporator and the pressure in the collecting vessel has reached a certain excess in the evaporator, so that vapor escapes from the latter to the collecting vessel, and simultaneously, by way of the same valve and through the same conduit, the refrigerating medium in the collecting vessel is allowed to flow into the evaporator.

1,776,745—REFRIGERATING PLANT. Ivar Amundsen, Oslo, Norway. Original application filed Oct. 29, 1926, Serial No. 145,037, and in Norway Jan. 28, 1926. Divided and this application filed Sept. 29, 1927. Serial No. 222,850. 1 Claim. (Cl. 62—118.)

A refrigerating plant of the absorption type comprising a vessel adapted to contain a medium for alternately absorbing and liberating a refrigerating fluid, a shell forming a jacket surrounding said vessel, having a cooling water inlet adjacent the top of said shell and an outlet conduit adjacent the bottom, whereby undirectional flow of cooling fluid is effected, means for supplying cooling water intermittently to said shell, a receiver arranged below said outlet conduit, and communicating therewith at an intimate point, for retaining a portion of the cooling fluid, and means for heating the retained contents of said receiver at periods alternating with those during which cooling fluid is supplied to said shell, to provide steam within said shell for heating said vessel.

ISSUED SEPTEMBER 30

1,776,789—REFRIGERATOR SHOW CASE. John Edward Gloekler, Pittsburgh, Pa. Filed Mar. 21, 1928. Serial No. 263,284. 1 Claim. (Cl. 62—37.1.)

In a show case refrigerator, the combination with a supporting base having a floor, end walls, and a top, of a vertical back wall between the floor and top on one side, an upper outer transparent front wall at the opposite side extending from the top partially towards the floor, an inner front wall extending from the top co-extensive with said transparent wall and connected therewith by a lower transverse wall providing an enclosed illuminating transparent wall extending from the upper outer transparent wall to the chamber, an illuminant therein, a front floor and providing with the back wall a main commodity chamber, an ice supporting casing located immediately below the top and between the back wall and the inner front wall, consisting of side walls spaced inwardly therefrom and downwardly from the top for circulation, and having inwardly sloping extensions converging towards a middle open bottom, and a drip pan located below and extending at each side beyond said extensions for collection of water and providing intervening circulation.

1,776,910—COMBINATION REFRIGERATING AND HEATING EQUIPMENT. George E. Hulse, New Haven, Conn., assignor to The Silica Gel Corporation, Baltimore, Md., a Corporation of Maryland. Filed Feb. 17, 1928. Serial No. 255,161. 16 Claims. (Cl. 236—91.)

1,776,930—LATCH. Gordon E. Roedding, Grand Rapids, Mich., assignor to Grand Rapids Brass Company, Grand Rapids, Mich. Filed July 13, 1929. Serial No. 377,988. 4 Claims. (Cl. 292—332.)

4. In a latch, the combination with the housing, of a bolt mounted for swinging and tilting movement, a detent member mounted upon said housing for tilting swinging movement and operatively associated with said bolt to swing therewith but having tilting movement independent of said bolt, said housing being provided with a detent catch disposed to coact with said detent, and a spring for actuating said detent to engaging position, said bolt constituting means for releasing said detent.

1,777,094—APPARATUS FOR FREEZING MATERIALS. Robert E. Kolbe, Erie, Pa. Filed Aug. 12, 1929. Serial No. 385,137. 15 Claims. (Cl. 62—114.)

1. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves; and means for circulating a freezing medium in said compartment in contact with said receptacles.

1,777,183—LIQUID FOR PRODUCING LOW TEMPERATURES FOR COOLING PURPOSES. Albrecht Schmidt, Frankfort-on-the-Main, Germany, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany, a Corporation of Germany. Filed June 6, 1929, Serial No. 369,014, and in Germany July 6, 1928. 3 Claims. (Cl. 252—5.)

ISSUED OCTOBER 7

1,777,483—SHARP-FREEZING CONTAINER. Lloyd G. Copeman, Flint, Mich., assignor to Copeman Laboratories Company, Flint, Mich., a Corporation of Michigan. Filed June 28, 1928. Serial No. 288,928. 9 Claims. (Cl. 62—111.)

1. A sharp freezing container of the type adapted to be utilized in connection with low sides of mechanical refrigeration systems, comprising a container having walls and ice cube forming partitions moulded of rubber, and a combined cover plate and handle structure secured to one end of said rubber container.

1,777,495—PACKING BOX OF REFRIGERATING APPARATUS. Oades J. Kenyon, Santa Barbara, Calif., assignor to Instant Ice Corporation, Santa Barbara, Calif., a Corporation of Delaware. Filed Oct. 1, 1928. Serial No. 309,426. 3 Claims. (Cl. 286—9.)

1. In a packing box seal, the combination with a casing containing a fluid and a movable shaft extending through one wall of the casing, of a seal for the shaft preventing the fluid in the casing from escaping along the shaft, said seal including: a chamber surrounding the shaft exteriorly of the casing, a sealed container spaced from the shaft, a sealed reservoir containing a sealing fluid and arranged within the container co-operating with the walls of the latter to form an annular chamber, said annular chamber containing a supply of liquid and communicating with the casing and with the reservoir adjacent the bottom thereof for maintaining a pressure in the latter substantially equal to the pressure in the casing, and a conduit having one end communicating with the first mentioned chamber and the opposite end extending into the reservoir and terminating at a point adjacent the top thereof for supplying sealing fluid to the first mentioned chamber.

1,777,573—REFRIGERATING AND VENTILATING APPARATUS. Charles A. Moore, Edina, Minn. Filed Sept. 28, 1925, Serial No. 59,086. Renewed Aug. 2, 1929. 16 Claims. (Cl. 275—18.)

1,777,714—REFRIGERATOR. George Francis Butler and Elizabeth Frome, Racine, Wis.; said Butler assignor of one-fourth to Gertrude Frances Butler, Racine, Wis. Filed June 5, 1929. Serial No. 368,581. 2 Claims. (Cl. 62—69.)

1,777,782—EXTERNALLY AND INTERNALLY FINNED TUBE AND METHOD THEREFOR. Harry W. Bundy, Detroit, Mich., assignor to Bundy Tubing Company, Detroit, Mich., a Corporation of Michigan. Filed Feb. 11, 1929. Serial No. 339,033. 7 Claims. (Cl. 113—35.)

1,777,786—REFRIGERATOR CABINET. Lloyd G. Copeman, Flint, Mich., assignor to Copeman Laboratories Company, Flint, Mich., a Corporation of Michigan. Filed Oct. 18, 1926. Serial No. 142,296. 9 Claims. (Cl. 62—95.)

1. A brineless ice cream cabinet, or similar structure, comprising a cast stone member separate from the cabinet for receiving the container to be cooled, a lining of insulating material closely adjacent said member and a refrigerating coil positioned in said space

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PATENTS

(Concluded from Opposite Page)

between said member and lining surrounding the cast stone member, said coil being separated from, but in heat conducting relation, to said member.

1,777,787—REFRIGERATOR. Lloyd G. Copeman, Flint, Mich., assignor to Copeman Laboratories Company, Flint, Mich., a Corporation of Michigan. Filed Jan. 5, 1928. Serial No. 244,579. 7 Claims. (Cl. 62—95.)

1. A refrigerator, having in combination a cabinet, an inner shell of sheet metal, including a portion arranged to cover refrigerant receiving and circulating means, and an initially plastic stone layer intervening between the inner shell and the cabinet and defining the sharp freezing chamber and serving to act as a hold-over, said shell forming a mold for receiving the plastic stone and for sealing the same after setting.

1,777,842—COOLING-COIL HEADER FOR ICELESS REFRIGERATORS. William C. Gibson, Chicago, Ill. Filed Oct. 5, 1928. Serial No. 310,585. 3 Claims. (Cl. 137—104.)

2. The combination of a valve, a float, and an arm carrying the float and connected with the valve, and means for holding the float arm and float in rigid position, comprising a locking arm slidably engaged with said float arm and permitting normal operation of the float and valve, a push rod to engage the locking arm and cause said locking arm to hold said float arm rigid, and means for operating said push rod.

1,777,843—WATER COOLER. Vito Glisci, Waterbury, Conn. Filed Sept. 24, 1929. Serial No. 394,836. 3 Claims. (Cl. 62—90.)

1. A water cooler comprising a casing, a tank in said casing, a coil through which water to be cooled flows into said tank, a delivery pipe extending from said tank, means for spraying water onto said coil and means for simultaneously directing an air blast against said coil to evaporate the water on the surface thereof.

1,777,913—PROCESS AND APPARATUS FOR PRODUCING COOLING LIQUIDS. Nekolai Dahl, Trondhjem, Norway. Filed Apr. 5, 1926, Serial No. 99,954, and in Norway Feb. 7, 1921. 10 Claims. (Cl. 62—101.)

HARTFORD FRIGIDAIRE REPORTS PEAK VOLUME

Hartford, Conn.—Refrigerator Sales Company, 269 Trumbull Street, Frigidaire dealers, is maintaining a heavy volume of commercial installations this fall despite the current depression, according to Walter Gunberg, manager.

Three large walk-in coolers, built by the United Insulating Company, and a water-cooling system with two outlets have been installed at St. Thomas Seminary. A ¾ h. p. Frigidaire compressor provides refrigeration.

A 10 x 12 x 8 ft. flower cooler, with 1 h. p. Frigidaire unit and four of the new vertical type coils, and a smaller service case, 8 x 3 x 12 ft., both made to order, have been installed in the florist shop of Dillon & Dolan, Asylum Street. One h. p. and a ¾ h. p. units are of Frigidaire make.

Two flower cases, 18 cu. ft. apiece, and three Dyott kitchen cabinets of 9 cu. ft., with a circulating water-cooling system controlled from a central tank in the basement, were recently installed in the new Florence Crane Building at Hartford General Hospital. A 1 h. p. unit refrigerates the five cases, and a ½ h. p. on the water system.

An AP-60 case has been placed in the cafeteria in the new addition to the West Hartford High School Building, with two Model 42 water coolers.

The Avery Convalescent Home, now under construction at the Hartford General Hospital, has been supplied with two large storage coolers, 10 x 8 x 10 ft., and two service cases, each of 50 cu. ft. capacity. Storage box units are each 1 h. p., with ¾ h. p. on the service boxes.

A 45-ft. Seeger cooler with ⅓ h.p. unit has been placed in the Wells Diner, Allyn Street.

Sixteen domestic refrigerators of 4 cu. ft. capacity, with 1 h. p. central unit, have been installed in an apartment building on Ann Street, owned by William Mulligan.

Twenty-four of 4 cu. ft. size were recently placed in Michael Delaney's apartment house at 36 Capitol Avenue, with one 1 h. p. and one ⅓ h. p. central units, while twelve of 5 cu. ft. were installed in another building owned by Mr. Delaney on Gillette Street. The central unit is 1 h. p.

The Refrigerator Sales Company also has a large share in the huge refrigeration installation in the new Aetna Life Insurance Company building on Farmington Avenue, and is installing units for display cases in a new market of the Eastern Provision Company on Main Street. The cases, two 12 ft., one 6 ft. and one 4 ft., are being built by the Hartford Store Fixture Company. A 1 h. p. unit for the two 12 ft. cases, and a ⅓ for the 6 and 4, are being installed.

GOOD MARKET IN BRAZIL FOR REFRIGERATION

Cleveland, Ohio—There is a great potential market for electric refrigerators in Brazil, according to H. R. Bittencourt, of Rio de Janeiro, who has been visiting the headquarters here of the electric refrigeration department, General Electric Company.

"We need refrigeration there all the rear around," he says. "There is no question about that. And the market for electric refrigerators is opening up in fine shape."

Bittencourt is connected with General Electric, S. A., of Brazil, and while in this country he has been visiting the General Electric factories at Schenectady, refrigeration headquarters here, and various distributorships in other cities.

SPANISH COPELAND DEALER WINS MEDAL

Madrid, Spain—Gumersindo Garcia, of Productos Copeland, was awarded the diploma of honor and first medal by the prize board of the National Live Stock and Related Industries Exposition, which was recently held here. The award was given for a group of Copeland commercial installations, considered by the committee to be the most outstanding submitted.

"Productos Copeland" has been a Copeland representative under the H. M. Robins Company for some time, and its president, Gumersindo Garcia, is well known in the city.

EXPORT SHIPMENTS OF ELECTRIC REFRIGERATORS

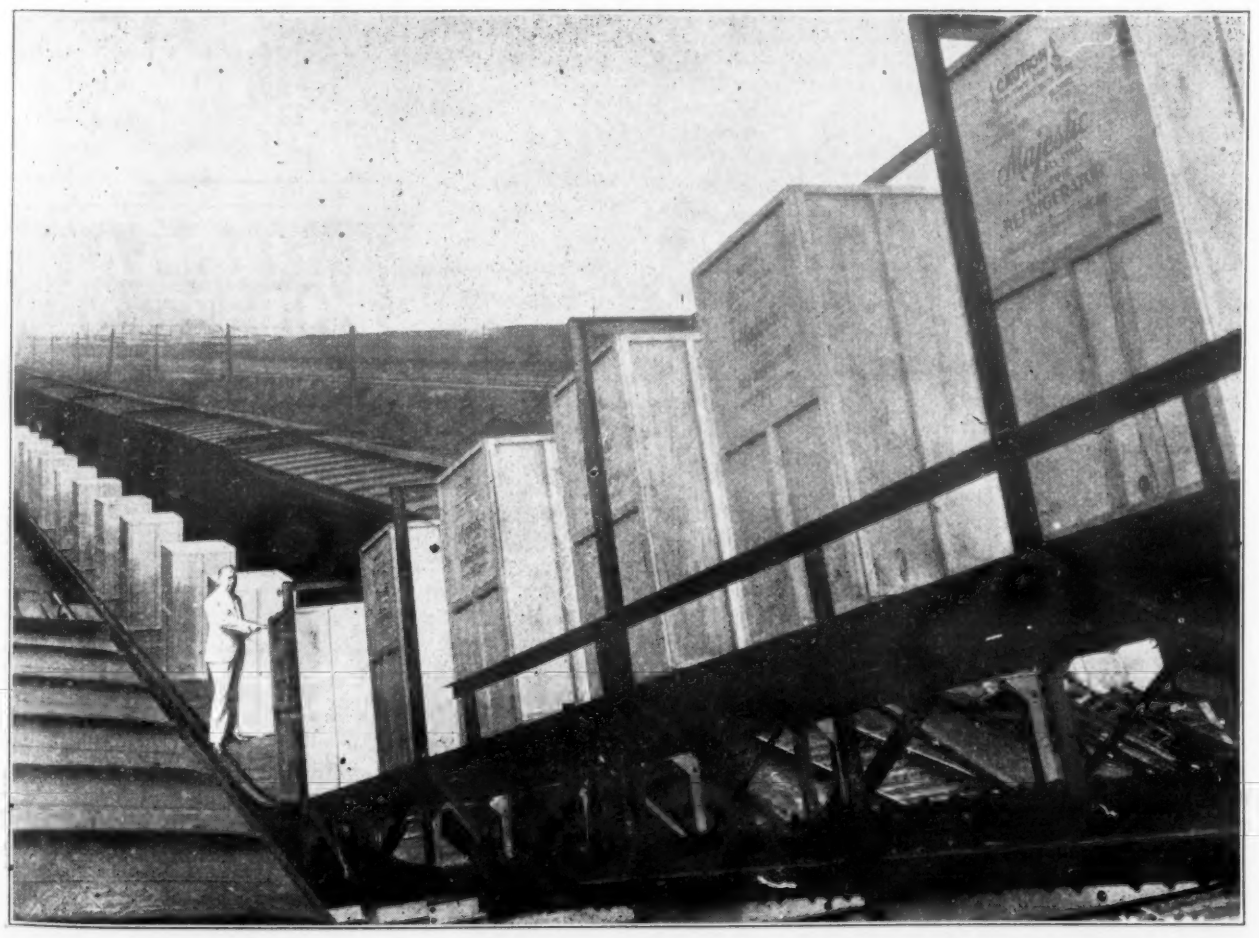
August Shipments Reported by the Bureau of Foreign and Domestic Commerce

	Electric Household Refrigerators No.	Val.	Electric Commercial Refrigerators Up to 1 Ton No.	Val.
Austria	8	784	..	.....
Belgium	714	106,521	99	28,468
Czechoslovakia	10	1,101	..	.....
Denmark	5	637	24	3,915
Finland	1	319	..	.....
France	125	15,376	10	892
Germany	336	23,471	7	1,723
Greece	4	985	..	.....
Irish Free State	36	2,742	..	.....
Italy	1	340	1	180
Netherlands	106	10,948	11	2,590
Norway	15	4,870	..	.....
Poland and Danzig	7	829	..	.....
Portugal	11	1,957	..	.....
Rumania	..	.....	2	327
Spain	41	4,990	17	6,074
Sweden	92	7,780	..	.....
Switzerland	90	9,170	..	.....
United Kingdom	161	14,393	10	3,205
Canada	562	70,559	133	24,190
Costa Rica	4	633	..	.....
Guatemala	3	734	1	168
Honduras	8	1,339	..	.....
Nicaragua	1	199	..	.....
Panama	45	9,556	1	469
Salvador	6	1,384	..	.....
Mexico	154	27,827	4	2,753
Bermudas	35	6,553	1	498
Barbados	1	221	..	.....
Jamaica	1	160	..	.....
Trinidad and Tobago	4	776	1	897
Other British West Indies	7	1,058	1	125
Cuba	173	27,513	69	12,156
Dominican Republic	25	4,444	2	982
Netherland West Indies	19	3,517	..	.....
Haiti, Republic of	14	3,009	2	323
Virgin Islands of U. S.	3	1,145	..	.....
Argentina	839	71,801	50	5,370
Brazil	100	11,060	14	9,498
Chile	69	9,740	1	268
Colombia	24	3,948	..	.....
Peru	10	1,234	2	300
Uruguay	108	16,920	48	11,264
Venezuela	113	17,288	11	4,669
British India	33	2,955	50	4,829
British Malaya	86	10,619	9	2,545
Ceylon	2	549	..	.....
China	57	7,828	..	.....
Java and Madura	23	1,498	..	.....
Other Netherland East Indies	9	2,115	3	1,089
French Indo-China	35	4,634	..	.....
Japan	65	9,936	10	2,696
Philippine Islands	67	8,593	1	172
Siam	3	615	..	.....
Syria	2	530	..	.....
Turkey	3	476	1	215
Australia	26	7,758	6	920
New Zealand	10	1,750	7	409
British East Africa	8	1,516	4	481
Union of South Africa	86	16,333	3	1,215
Gold Coast	4	572	..	.....
Nigeria	28	4,322	..	.....
Other British West Africa	6	831	..	.....
Egypt	4	513	..	.....
Algeria and Tunisia	3	213	..	.....
Morocco	21	2,118	6	744
Total	4,672	$586,105	622	$136,619
Shipments to—				
Hawaii	229	$ 29,102	18	$ 2,793
Porto Rico	46	$ 6,887	6	$ 1,397

PORTO-RICAN DISTRIBUTOR VISITS DETROIT

Detroit, Mich.—A recent visitor to Detroit was Jose Andreu, president of Andreu, Aguilar & Company, Inc., Copeland distributors in San Juan, Porto Rico.

Majestics Roll Off at Rapid Clip



William C. Grunow Watches Majestic Line as 800 Refrigerators Roll per Day.

FINE EXAMPLE SET BY DEALERS IN BRIDGEPORT

Bridgeport, Conn.—Nine newly appointed Majestic refrigerator dealers have formed a co-operative body under the name of "Associated Majestic Refrigerator Dealers." The purpose of the organization is to prevent unfair competition and make possible more effective advertising displays.

The dealers have agreed on standard prices and are advertising co-operatively, thus securing larger display at less cost per dealer. Other features of the plan include exchange of refrigerators, if one dealer is out of a model he receives an order for, and similar advantages.

Meetings are held frequently at the Whiting Radio Service, Inc., 308 Fairfield Avenue. Sherman E. Whiting, of the firm, is general chairman of the dealers' organization. Other dealers on the roster are: John F. Fant, 1390 Stratford Avenue; Paul Goodell, Main Street, Stratford; Bonney Electric Company, 733 Post Road, Fairfield; Park City Furniture Company, 275 State Street; Radio Equipment, Inc., 118 Congress Street; Hadley Company, 1021 Broad Street; E. K. Music Shop, 970 East Main Street, and the Gilbert Radio Company, 2928 Fairfield Avenue.

SANDWICH SHOP INSTALLS COPELAND EQUIPMENT

Buffalo, N. Y.—The newly-opened Dawson Sandwich Shop, located at 187 Delaware Ave., here, has Copeland electric refrigeration equipment throughout. Two 6-foot milk chests and one 8-foot salad pan are Copeland-refrigerated. In addition, two coolers and a drinking fountain are connected to a Copeland compressor.

REQUESTS FOR INFORMATION

Readers who can be of assistance in furnishing correct answers to inquiries, or who can supply additional information, are invited to address Electric Refrigeration News, mentioning query number.

Export Business

Query No. 389—"I would like to know of any firm making a small, durable refrigerating machine having motive power other than by electricity. There would be a big demand for plants of that type here."

SEATTLE ICE-O-MATIC COMPANY REORGANIZES

Seattle, Wash.—The Seattle Heat & Cold, Inc., has been replaced by the newly-formed Utility Service Corporation. The new company will handle the Williams Ice-O-Matic electric refrigerators and the Williams Oil-O-Matic oil burners.

Headquarters, sales rooms, display quarters, and offices have been taken at 1819 Olive Way, Seattle.

F. W. Boaler is the president of the new company. Associated with him is J. B. Ernsdorff, the former head of the Seattle Heat & Cold, Inc., which has been reorganized into new company replacing it.

COPELAND-TEMPRITE EQUIP NEW BANK BUILDING

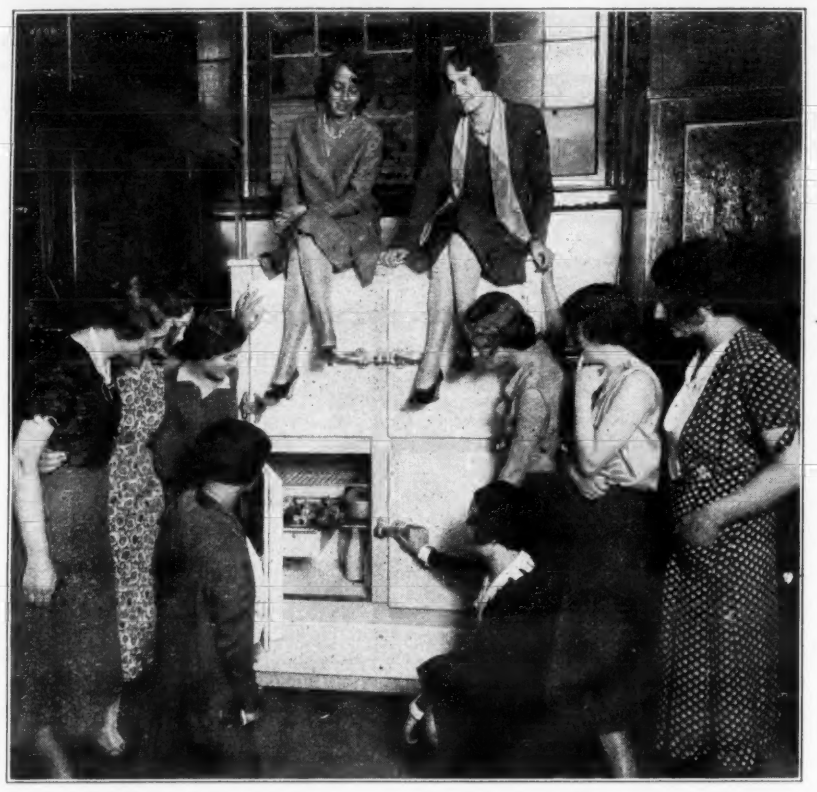
Mt. Clemens, Mich.—O. R. Dickerson Temprite distributor, is installing a complete water-cooling system in the new 350,000 **Citizens' National Bank Bldg**

This installation provides four drinking fountains, using Temprite Model No. 110 wall fixtures, specially finished in cream color to match the decorative scheme of the building's interior. The system is operated with a Copeland Model R compressor.

MILLER ADVANCED

Miami, Fla.—Appointment of J. T. Miller as sales manager has been announced by the Kelvinator-Miami Co., 50 W. Flagler Street. Mr. Miller has been with the Kelvinator organization in various sales capacities, and has had charge of promotion activities in other fields for the past five years, coming to Miami from Lubbec, Texas.

Initiated



Seattle, Wash.—Co-eds of the University of Washington, members of Delta Delta Delta sorority, seeking to get utmost use from a newly purchased Frigidaire, have utilized the Frigidaire Hydrator for storing corsage bouquets to such an extent that an order for an extra Hydrator was placed by the cook so she would have storage space for green vegetables.

The new AP-18, installed in the Tri-Delt house, is one of a number to be placed in use on the University of Washington campus recently. Sigma Kappa and Alpha Gamma Delta also use Frigidaire, not only for keeping food fresh, but flowers unwilted.

Some time ago the Seattle branch placed a Frigidaire in the Home Economics department of the university.

BI-WEEKLY MEETINGS KEEP SALESMAN KEYED UP

Cincinnati, Ohio—The Service Department of the A. L. Fink Electric Company, here, Copeland distributors, hold regular bi-weekly meetings which are voluntarily attended by all members of the staff. The meetings held every other Tuesday in the shop office are conducted as "smokers" which accounts in part for their popularity.

The feature of each meeting is an outside speaker sent by the manufacturer of some product handled by the A. L. Fink Electric Company. He talks on service problems. After the speaker is finished a discussion of his talk follows. Any special problems which have evolved since the last meeting are then brought up and suggestions given to the assembled group.

Recently a Copeland factory service representative addressed the group and talked on electric refrigeration. By holding these "smokers," Austin Jones, service manager of the A. L. Fink Electric Company, has found that the interest of the men has been constantly maintained.

BALTIMORE RADIO OUTLET TO SELL NORGES

Baltimore, Md.—The Eastern Hardware & Supply Company, Charles and Lombard Streets, Baltimore, Md., prominent distributors in metropolitan Baltimore and western Maryland of Philco radios, has taken on the distribution of the Norge electric refrigerator. Several models of the Norge have been received and the concern plans in the immediate future to launch a program for lining up the trade with which it now has dealings to take on the Norge refrigerator. Many Philco radio dealers are expected to take on the Norge.

C. F. Farnen is president of the company. J. Robert Wanen is general manager of the company, and J. Elmer is advertising counselor.

PERSONNEL CHANGES MADE BY FLORIDA COMPANY

St. Petersburg, Fla.—George N. Bicknew, who has been with the Florida Electric Refrigeration Co., General Electric refrigerator distributor, since its inception, has been placed in charge of retail sales. R. H. Cartnell, formerly product manager, has been appointed wholesale manager, and Rex Stonestreet has been made manager of the Miami Electric Refrigeration Co.

JAMES & CO. OCCUPY OLD BULLPITT STORE IN SPRINGFIELD

Springfield, Ill.—James & Co., Inc., Planters' Bldg., St. Louis, have opened a new store at 403 South Fifth Street, the salesroom recently occupied by the Bulpitt Refrigeration Company, and will handle General Electric refrigerators and all electric appliances. The Bulpitt Refrigeration Company was absorbed by R. Cooper Co., Inc., 120 South La Salle Street, Chicago, and James & Co., Inc.

OMAHA HAS MODERN DRUG STORE

Omaha, Neb.—The new Metropolitan drug store, J. L. Brandeis & Sons, owners and operators, is well supplied with electric refrigeration. The equipment consists of four one hp. compressors and one ¾ hp. compressor. These take care of the soda fountain, floral box, storage in the basement, water cooler for the drug store proper as well as the sandwich department. The Omaha branch of Frigidaire provided the refrigeration, and the fountain and all cases in the store were made by the Omaha Fixture & Supply Co.

ANOTHER FOR SCHAEFER

Milwaukee, Wis.—The E. H. Schaefer Corporation, distributors of G. E. units, has made two large installations in Milwaukee recently.

In the new twenty-three story Mariner Tower in the downtown district at Sixth and Wisconsin Ave., the Schaefer crew installed 220 water coolers, one for each office. They also placed a large commercial installation recently in a new Chinese restaurant on the corner of Third and Wright Sts., where a CF-602, a C-270, a TL-13 an ice maker, and a DP-3 water cooler are now on duty.

The Expansion Valve

By GEORGE F. TAUBENECK

"Even a dub can remove the unit." That isn't the slogan of the new Servel Hermetic electric refrigerator, but it ought to be. Recently the Valve was in Evansville, Indiana, looking over the production equipment recently installed in the Servel plant, and proved this should-be slogan to his entire satisfaction.

Paul Jones, the genial and perpetually smiling young advertising manager of Servel, Inc., made the tour of inspection with us. At one point in the journey the guide left us for some reason or other, and the two of us found ourselves all alone in a room full of refrigerators.

"I've always been curious to see if these engineers around here know what they're talking about," grinned Mr. Jones. "What do you say to our trying to take a unit out of a box while nobody is looking?"

So we tried it. An advertising manager and a reporter. The writing clan is notoriously clumsy with and bewildered by machinery and tools; and both of us will admit when cornered that our hands are overstocked with thumbs where machinery is concerned.

There was a screwdriver there, much too big for the task; but with it we managed to remove all the screws in sight (to wit: four) from the back of the refrigerator.

We heaved and we tugged and we pulled, but to no avail. The unit still remained firmly in place (it is supposed to slide easily out of the back of the refrigerator when the screws are removed).

Paul opined that something must be wrong. His intuition was uncanny. I agreed. After a bit of amateurish surveying, we found a little steel bar at the bottom of the refrigerator back that seemed to be holding up the procession.

Two screws with rather troublesome taps affixed this bar to the cabinet. These removed, the bar dropped off, and the unit slid out like a rowboat gliding away from its mooring.

We paused a bit to admire our handiwork and proffer mutual congratulations and felicitations. A big heave and a twist by Mr. Jones, and the unit settled back into position. The screws went back in much more easily than they came out.

The total elapsed time, counting the embarrassing interlude when we were temporarily baffled, was barely over seven minutes.

Other activities besides refrigeration are housed in the space-eating Servel plants. Hercules gas engines and truck bodies are made there, also.

The gas engines are built almost entirely for export trade. Wherever electric power isn't available, Hercules engines fill the gap, according to company officials.

A recent development in the manufacturing of Hercules truck bodies is a special refrigerated truck. The combination is obvious. A company which makes both refrigeration units and truck bodies might well turn its attention to hooking up the two products.

One of the largest foundries on record is located within the Servel bailiwick. Its principal purpose is making the castings for Hercules engines and Servel compressors; but it has so much room to spare that Servel engineers have many of their production tools made there.

They design just what they want, and the foundry fills the bill. Handy, eh wot?

At the Copeland plant in Mt. Clemens, Mich. (an hour's drive from the heart of Detroit) somewhat different conditions prevail. Engineers out there maintain that their factory turns out more refrigerators per square foot than any other refrigeration plant in the country.

The casual visitor is inclined to place considerable credence in this claim, for one has to step high, wide, and handsome to move from one section to another.

At noontime the office is instantly converted into a clubroom. Desks become bridge-tables, and everybody seems to have a glorious time. The recreation period finished, the deuces, treys, jacks, and queens disappear, and out come the piles of papers.

The next step should be the conversion of the factory proper into a miniature golf course. The hazards are there, ready and waiting, and all they need is a boxfull of ill-assorted, unbalanced putters, plus a gross or two of lopsided, Easter-egg-colored balls, a carton of two-inch pencils, and an impossible estimation of par.

A contributor mails us a clipping from the want-ad column of the Chicago Tribune, to-wit:

"FOR SALE: Lake Shore Athletic Club membership, or will trade for G. E. refrigerator."

Who's next?

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance — Positions Wanted — fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion $3.00, additional words six cents each. Three insertions $8.00, additional words sixteen cents each.

POSITIONS WANTED

SALES Manager wanted. A western Pennsylvania distributor of electric refrigeration is seeking a domestic sales manager with a proven record of success in sales, and in organizing and directing a large group of retail salesmen. Equipment is product of $10,000,000.00 corporation, financially strong and with outstanding record. Fine opportunity and proposition for man who can qualify. Applications held in strictest confidence. Box 294.

POSITIONS WANTED

EXPERIENCED service man available. Thoroughly familiar through long experience with Frigidaire and Kelvinator installation and service. Formerly employed by Kelvinator-Nizer and several ice cream manufacturers. Best of references as to ability and character. Wish to obtain service or general repair work. Address Box 285.

MISCELLANEOUS

WANTED—Servel units for cash No. 1, No. 8, No. 15, No. 21, No. 22-A. Boxes and tanks not wanted. State price and full details. Box 288.

CASH: For discontinued stock of low pressure automatic refrigerating compressors and coils. Submit full description, prices, etc., to Box 290.

NATIONALLY known manufacturers of food store equipment, which includes refrigerator display cases, and having national sales organization desires to effect co-operation sales plan with manufacturer having supplementary line of walk-in coolers and institutional refrigerator equipment. Describe your line, facilities and present sales program in first letter. Write Box 291.

Refrigerated Food Section

In Three Parts—Part 2

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, NO. 5, SERIAL NO. 107

DETROIT, MICHIGAN, NOVEMBER 5, 1930

Entered as second class matter Aug. 1, 1927, at Detroit, Mich.

FIFTEEN CENTS PER COPY
TWO DOLLARS PER YEAR

FLORIDA

Citrus Growers To Freeze Orange Juice

Tampa, Fla.—The freezing of orange juice on a scale never before attempted is assured by the action of the Florida Citrus Exchange in making, through its subsidiary, the Exchange Juice Company, a long term contract with the National Juice Corporation for the distribution of frozen orange juice in various parts of the country. The National Juice Corporation is a subsidiary of the National Dairy Products, Inc., and plans to deliver orange juice with the morning's milk.

Test campaigns are to be conducted in three cities—Rochester, N. Y., Philadelphia, Pa., and Memphis, Tenn. The public reaction to the product will be carefully watched and measured in these test cities, and future plans will of course depend upon the knowledge thus gained.

The contract which was announced recently by C. C. Commander, general manager of the Florida Citrus Exchange, covers a term of 11 years, and provides for the distribution of millions of boxes of oranges. It will enable the growers to market vast quantities of fruit which are too small for shipping to the usual market, but which have high juice content.

The juice will be frozen at plants in Florida and will then be shipped north in solid condition. The National Juice Corporation will take care of the defrosting, bottling and distribution. Last season orange juice was frozen here by the Tampa Union Terminal Company, and it is expected that more freezing will be done by that organization under the terms of the new contract.

Plan Proves Popular

The plan seems popular with the growers, and at a recent meeting in Winter Haven Mr. Commander was assured of the support of the members of the Citrus Exchange in the following orange growing centers: Florence Villa, Kissimmee, Plymouth, Tavares, Haines City, Arcadia, Dade City, Winter Garden, Mims, Okahumpa, Dundee, Cocoa, Fort Myers, Umatilla, Geneva, Sarasota, Clearwater, Winter Haven, Lake Grafield, River Valley, Lake Placid, Frostproof, Citrus City, Manatee, DeLand, Lakeland, and Lake Region.

Mr. Commander presented the plan to the association directors and managers, speaking in part as follows:

"Experience over recent years in merchandising the Florida citrus crop has emphasized the necessity for the development of some method other than that now used for the disposal at a profit to the grower of lower grade oranges. Each succeeding season the situation has become more and more acute.

"We are entering the 1930-31 season with a fairly large crop of citrus. California also has a comparably large crop. In addition, the economic conditions—consumer buying power—throughout our markets is none too good.

"The problem of the profitable disposal of the lower grades of fruit under such conditions reaches a climax. This situation with respect to grapefruit has been satisfactorily met. All growers today are familiar with the contracts which have been made on cannery grade grapefruit, disposing of the total Exchange supply of this grade at a price

(Concluded on Page 8, Column 5)

TOM HUSTON TO EXTEND FREEZING ACTIVITIES

Columbus, Ga.—The Tom Huston Frozen Foods, Inc., is said to be interested in frozen Florida orange juice, and representatives of Mr. Huston are now negotiating with the Florida Citrus Exchange for a supply of fruit for a freezing plant which he proposes to establish in Florida this season. Two locations are now being considered, one at Orlando and the other at Tampa. It is proposed to freeze the orange juice in small consumer packages. Later on other Florida products, such as strawberries, tomato juice, grape juice, figs and a combination salad of various Florida fruits may be added.

The success with which the Huston organization has met in its peach freezing operations, has encouraged ventures into other freezing work. It is understood that not only in Florida, but in other southern states, Huston freezing plants will be established.

More About Z

A LETTER just received from M. T. Zarotschenzeff reports that good progress is being made at the demonstration quick freezing plant which Mr. Zarotschenzeff is operating in the north of England. On December 4th, the inventor of the "Z" process of rapid freezing is to read a paper on "Rapid Freezing and Chilling Methods" before the British Association of Refrigeration in London.

He also has prepared several articles for the Refrigerated Food section of the News, and the first of them will be published in the next (November 19) issue.

Vladimir Zarotschenzeff, son of the inventor, who has been helping his father in the last few months, will leave London in the middle of December and return to the United States.

Standardized Production Next Big Step In Making Cases for Quick-Frozen Food

Engineers at Detroit A.S.R.E. Meeting Outline Specifications Which Industry Must Meet in New Era

Detroit, Mich.—Talking of low temperature refrigeration and quick-frozen foods as accomplished facts, and devoting themselves to ways and means for improvement of a going business, a distinguished group of speakers appeared before the Detroit section of the American Society of Refrigerating Engineers in Webster Hall on the evening of November 3rd. Headed by Harry D. Edwards, president of the A. S. R. E., who came out from New York to speak on low temperature refrigerants, every man who got on his feet at the call of F. M. Cockrell, publisher of ELECTRIC REFRIGERATION NEWS and chairman of the meeting, voiced his confidence in the future of the new movement which threatens to revolutionize the distribution of foods.

H. D. Edwards First

There were nearly two hundred persons in the hall when the speech-making began after dinner, Mr. Edwards being first on the long list. He wasted no time in arguing the merits of quick-freezing and other low temperature applications, but plunged at once into a technical discussion of the refrigerants best suited to the production and maintenance of low temperatures. His talk was illustrated with slides. He brought out the fact that the known refrigerants and the refrigeration cycles in use at present are able to produce as low temperatures as will be needed.

The problems of the manufacturer of refrigerated display cases were the next subject of discussion. A paper by D. E. Rutishauser, of the Hussmann-Ligonier Company, who was unable to be present, was read by C. C. Thomas, of Kelvinator. After discussing various phases of display case design, including the 45-degree sloping shelf with its attendant increase in storage space, Mr. Rutishauser's paper closed with the following forecast:

"It does not appear at this time as though manually or automatically operated defrosting equipment can stand the vigorous usage, or sometimes neglectful usage, to which they will be subjected in the average store. The tendency must be towards simplification through correct design rather than try to solve the problem by employing complicated mechanisms which may require more service and attention than store equipment will permit.

"Looking into the future, as far as we dare, with the limited amount of information available, the tendency leans towards building low temperature cases and storage boxes in small units which will permit the average merchant to enter the field at a minimum of cost. Starting with one small unit, the capacity of the store equipment can be increased in proportion to the added volume in sales by the addition of one or two more sections of either cases or storage boxes to meet the individual requirements. This plan is flexible in that it will permit the smaller stores to maintain larger storage capacities in proportion to the limited display space available.

"Low temperature equipment, due to its construction, must, of necessity, cost more than the average store fixture, and to put a heavy financial burden on the individual store would seriously handicap the progress that would normally be made in this field."

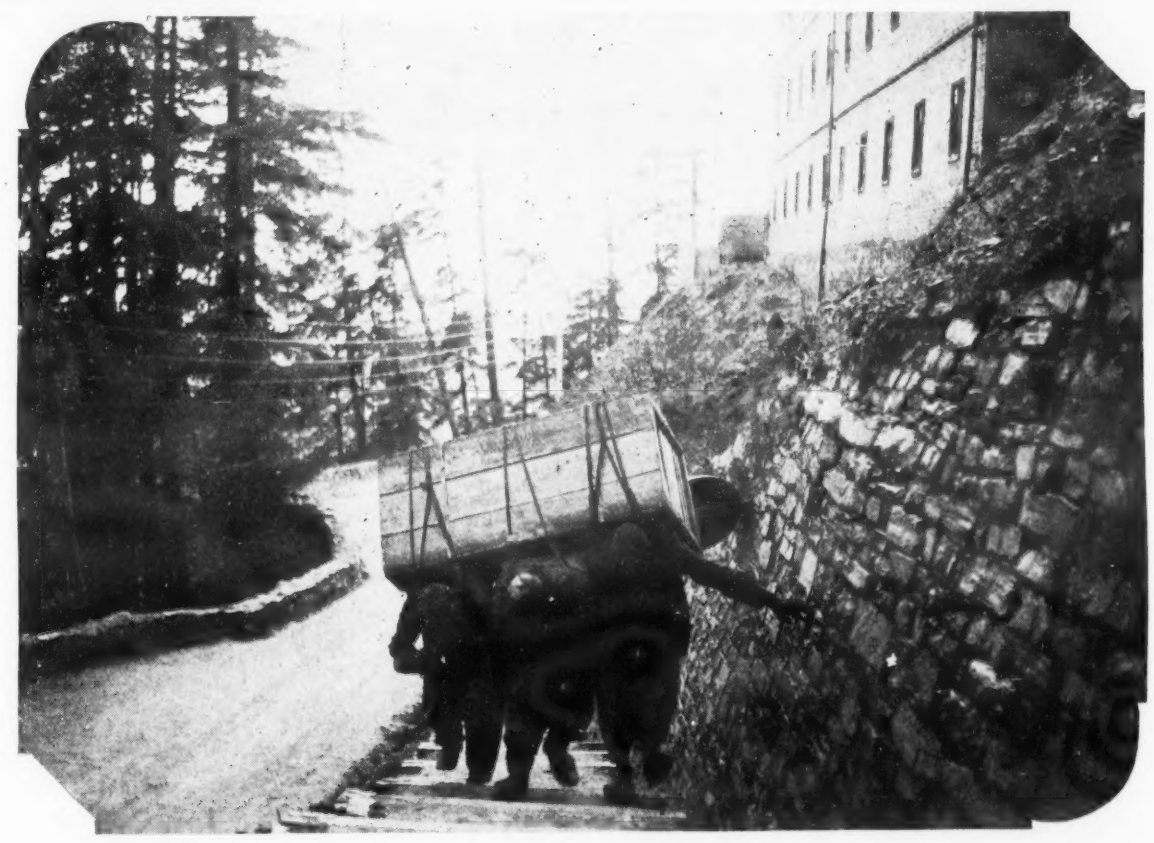
Hopkins and Hill

Continuing the discussion of the same subject, G. J. Hopkins, of the McCray Refrigerator Corporation, and J. W. Hill, of Campbell-Hill, Inc., were called upon. Right at the outset, Mr. Hopkins challenged the theory that the lavish use of display is necessary, reminding his hearers that display always involves a compromise between visibility and insulation. Turning to the much discussed question of air circulation, he expressed the opinion that some air circulation was inevitable and therefore measures should be taken to control it.

Mr. Hill began his remarks with the statement that quick-frozen foods presented such a new problem that the manufacturer should discard his former experience with higher temperatures, and approach this new problem with a "blank mind." He lined himself up on

(Continued on Page 2, Column 4)

Indispensable



When the British officials in India move to the mountains their refrigerators go with them. This one is a Frigidaire.

CUDAHY

Pushes Sale of Frozen Meats

Omaha, Neb.—The Cudahy Packing Co., Omaha, is continuing the effort to place its quick-frozen Fancy Cut Meats in the stores of the territory covered by this house and its branches. The experiment has now progressed to the point where the company knows what item to process for the public. Demand indicates the consumers will take readily to the veal and lamb chops, pork chops and pork roasts, with an inclination to accept the prepared boned and rolled rib roasts of beef.

Al. Diesing, now in charge of the Fancy Cut Meat department, stated that he could distinguish no difference between the southern and northern markets. In the beginning it was generally expected the southern people would take more readily to the quick-frozen products. That proved a fallacy as there is no appreciable difference in the territory as far as consumption of products is concerned. "In fact," said Mr. Diesing, "it all seems to depend on which branch house worked the idea the hardest for a certain period."

The Cudahy Packing Co., Omaha, is now employing a score of persons in this department. Special machinery has been designed to cut, tender and weigh the product. The temperature of the work room is kept at 30 degrees. That makes it uncomfortable for the workers and it has been difficult to obtain girls for the wrapping department.

Speaking of the operation to tender all steaks in the quick-frozen line, Mr. Diesing stated there was yet room for an invention that would increase the tenderness of steak without cutting through, and work rapidly. This company has tried out two plans of its own but is not yet satisfied. The last was in the form of a punch.

Some of the packers at first held to the belief that restaurants and large hotels would be the heavy users of the Fancy Cut Meats, but that idea has been discarded on account of actual experience, showing that housewives in general have set the pace in buying thus far. All increase in consumption must come from individual families, is now the opinion held by those in the business in Omaha.

George Graham, in charge of the Cudahy wholesale meat market in Omaha, is rather optimistic in regard of future sales of the Fancy Cut Meats. "Progress has ever been slow but sure," said Mr. Graham. "The time was when crackers were all sold in bulk, and the first introduction of package crackers met with strong opposition, but now you cannot induce the housewife to purchase crackers from the old wooden box. Just so it will be with selling the Fancy Cut Meats."

Inquiry revealed the fact that the butchers of Omaha, as a whole, are rather opposed to the idea of selling the quick-frozen special meat cuts. Just now the success of the movement, as far as Omaha is concerned, seems to rest with the electrical refrigerator men. Many of the delicatessens now carry a line of fine sausages and other cured meats and fish, and it is but a step to quick-frozen meats if the proper equipment can be had.

NEW REFRIGERATED CASES FOR MUNCIE STORES

Muncie, Ind.—New mechanically refrigerated cases are to be installed in the Muncie stores where the Sally Lee Frigid meats are being sold. The experimental sales campaign here is running along smoothly, with a gradual increase in the volume of repeat business, indicating that the housewives who try the quick-frozen meats generally come back for more.

The officials of the Indianapolis Abattoir, which is freezing and packaging the meats on sale here, seem well pleased with the results obtained, but as yet have made no announcement in regard to their plans for the future.

HOME

Service Women Are Invaluable

Cleveland, Ohio—The increasing importance of home service in the progress of the refrigeration industry was made plain by about fifty women who attended a home service conference held here Oct. 30 and 31 by the refrigeration department of the General Electric Company. Those who attended were from G. E. distributor organizations, public utilities and food manufacturing companies. They came to Cleveland, exchanged experiences in the presence of an intensely interested group of G. E. executives, and went back to their work of building good will for the electric refrigerator in their communities.

Miss Edwina Nolan, who is in general charge of the G. E. home service activities, was in charge of the two-day meeting, and arrranged a program which presented all sides of the home service development. The women from outside the G. E. ranks, such as Miss Ada Bessie Swann, of the Public Service Company of New Jersey, Mrs. Mildred Day of the Kellogg Products Company, Miss Marion Hayes, of the Brooklyn Eagle Guild, Miss Gladys Ford, of the Knox Gelatine Company, and Miss E. M. Gerahty, of the Lakeside Hospital of Cleveland, brought to the meeting a viewpoint uncolored by any direct interest in G. E. refrigerators.

The G. E. insiders, whose daily work is to think and talk G. E., naturally presented a somewhat different slant, and the combination of the two points of view proved most interesting.

Then there were a few men speakers, most of them G. E. executives, who seized the occasion to explain in considerable detail what their various departments are doing in connection with the company's home service work.

P. B. Zimmerman, sales manager, opened the conference on Thursday

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Home Service Workers Assemble and Exchange Ideas

(Concluded from Page 1, Column 4)

morning with a welcoming speech in which he touched on some of the high spots of the G. E. program. He was followed by Miss Nolan who talked of the plans for pushing home service work during 1931, and then called on Mrs. Mabel F. Neal of the Electric Refrigeration Company of New England, of Boston. Mrs. Neal brought up at the outset of her remarks a question which kept cropping up all through the conference, and which was still an open question when the last session was over. That question, "Should home service women sell?" is still unanswered so far as G. E. is concerned, but a great deal of valuable evidence was adduced on both sides. Mrs. Neal believes that home service women not only should sell, but can sell. Her method of proving that they can sell is simple. During the last twelve months she has sold 225 refrigerators. Most of her work is done in the towns around Boston, and her description of demonstration classes every night in the week in New England mill towns helped to show why she has succeeded so well in making sales.

Activities in Detroit

Next to contribute their experiences were Mrs. Helen Kile, of the McCormick-George Co., Detroit, and Mrs. Helen Murray, of the Cushman Refrigeration Co. of Cleveland. Mrs. Kile started out about a year ago when her organization had inadequate quarters, with an intensive cultivation of church societies. She used to take a refrigerator right out to the church and demonstrate its pleasing habits at the close of the meeting. With the inclusion of a model kitchen and comfortable meeting room at the new McCormick-George headquarters, she transferred her activities to her own business hearthstone, and conducts a series of afternoon bridge parties which are yielding valuable prospects with great regularity. Her meeting room is engaged for every available day for several months ahead. Mrs. Kile was the first of a long line of women speakers who told about getting the names of good prospects in bunches of forty or fifty, a procedure that made the listening executives prick up all their ears.

Mrs. Murray has had remarkable success in Cleveland in getting apartment house business lined up. Her organization has worked out a plan which makes use of refrigerators which have already been installed in apartment houses to induce other tenants to demand the same equipment. These demonstrations are made in co-operation with the landlord who has already signed a blanket order for refrigerators, but who naturally does not push his tenants to demand that they be installed. Arranged for the early evening, Mrs. Murray's little meetings usually persuade practically every woman in the apartment house that she has worried along without electric refrigeration quite long enough.

A description of the work being carried on by the Brooklyn Eagle Guild closed the morning session. Miss Hayes admitted frankly that the G. E. refrigerator was only one of several that are demonstrated and discussed on the Guild's platform, but despite that fact, her vivid description of the remarkable record made by the Guild, which has its schedule filled for nearly a year ahead, was one of the talks that was most discussed by those who were at the meeting. She made it clear beyond the shadow of doubt that the assembling of women to listen to talks on household affairs is fast becoming a major industry.

There was a surplus of men on the Thursday afternoon program. A. L. Scaife began it by demonstrating the "visualizer" with the aid of some entertaining psychology. J. J. Donavan told about the apartment house situation, W. E. Landmesser reviewed a long list of unusual commercial applications, and Thomas H. Beck, president of *Collier's Weekly*, provided a running fire of humorous comment on sales methods, ancient and modern, that contained much more meat than was evident at the moment.

The women speakers were Miss Ford, who rather summarily rejected that old favorite, "cold cookery," in favor of a less alliterative but more attractive expression; Miss Nellie Snavely, of R. Cooper, Jr., Inc., Chicago, who made it clear that home service problems in a city the size of Chicago had little peculiarities all their own, and Miss Gerahty, Lakeside dietitian, who spoke earnestly and seriously on the opportunity to serve the cause of health by showing how the lower priced foods can be utilized with the help of electric refrigeration.

A banquet at the Statler was the climax of the day. There were no speeches, but Paul Dow, who was in charge of the arrangements, saw to it that no one noticed their omission.

Miss Swann was the chief speaker at the Friday morning session which began a little behind schedule. For the last six years she has been speaking over the radio, usually twice daily, and a large part of her talk was devoted to that branch of her work. Although she has built up a large personal following in New Jersey, Miss Swann has always made a point of trying to make the name of her company outshine her own in the minds of her hearers. She also outlined the ways in which central station home service directors can best cooperate with manufacturers' home service representatives, mentioning some of the mistakes that all too frequently are made by both sides.

Miss Emma M. Tighe of Boston, Miss Helen A. Smith of Rochester, N. Y., and Miss Sophie Malicki of Chicago, all employed by public utilities, then joined forces in a discussion of their work, led by A. C. Mayer.

The Men Have Their Say

The men again monopolized the afternoon session, although for a while they had to give way to Mrs. Day, who appeared on the kitchen stage at the end of the room and gave a Kellogg demonstration. Her manner of working and addressing her audience won her a storm of applause from her gallery of experts. Miss Dorothy Kirk, of New York, who collaborated with Miss Nolan in the preparation of the latest G. E. recipe book, also spoke.

Walter J. Daily, in charge of G. E. advertising, told of the plans for increased advertising and promotion work in 1931; W. M. Timmerman discussed the engineering aspects of the G. E. refrigerator, and A. M. Sweeny described the high standard of quality that the production organization is insisting upon. William Jabine, editor of ELECTRIC REFRIGERATION NEWS, spoke briefly on the home service page that has been a part of the Refrigerated Food section for the last few months, and asked those present to contribute to it.

Those who attended the conference were:

Viola Bingman, Penn Central Lt. & Pr. Co., Allentown, Penn.; Ila McGivern, Ohio Public Service Co., Mansfield, Ohio; I. M. Lackey, Electric Refrigerator Co. of N. E., Boston, Mass.; Marion Hayes, Brooklyn Daily Eagle, Brooklyn, N. Y.; Helen M. Murray, Cushman Refrigeration Co., Cleveland, O.; H. N. Trumbull, Cushman Refrigeration Co., Cleveland, O.; Essie Bill Russell, Middle West Utilities, Chicago, Ill.; Sophia Malicki, Middle West Utilities, Chicago, Ill.; Mary C. Kelly, R. Cooper, Jr., Inc., Chicago, Ill.; Nellie Snavely, R. Cooper, Jr., Inc., Chicago, Ill.; Mrs. Helene J. Foster, Philip H. Harrison Co., Newark, N. J.; Sadie A. McNulty, Wisconsin Pr. & Lt. Co., Madison, Wis.; Mrs. S. W. Sevin, Modern Home Utilities, Waterbury, Conn.; Helen Kirtland, Niagara Hudson Co., Buffalo, N. Y.; Catherine V. Hess, Wheeling Electric Co., Wheeling, W. Va.; Helen A. Smith, Rochester Gas & Elec. Corp., Rochester, N. Y.; Hazel M. Fletcher, Modern Home Utilities, Waterbury, Conn.; Mrs. Rena W. Gaynor, Torrington Home Utilities, Torrington, Conn.; Helen M. Kile, McCormick-George Co., Detroit, Mich.; Ella Fay McCue, Judson C. Burns, Philadelphia, Pa.; Miriam Porter, Knoxville Pr. & Lt. Co., Knoxville, Tenn.; Mrs. Mabel Neal, Elec. Refg. Co. of N. E., Boston, Mass.; Florence G. Chisholm, Malden Electric Co., Malden, Mass.; Emma Maurice Tighe, Boston Edison Co., Boston, Mass.; Mrs. W. W. Sanderson, Niagara Elec. Service Corp., Niagara Falls, N. Y.; Frances Thompson, Canadian General Elec. Co., Toronto, Canada; Virginia Mackowski, N. Y. State Elec. & Gas Corp., Lockport, N. Y.; Mrs. Mildred Day, Kellogg Company, Battle Creek, Mich.; Ruth Snodgrass, Bard-Barger, Inc., Columbus, Ohio; Mary E. Parkinson, Bard-Barger, Inc., Columbus, Ohio; Helen C. Koons, 1588 Ansel Road, Cleveland, Ohio; Mrs. M. Sullivan, Ohio Public Service Co., Port Clinton, Ohio; Mrs. Ann Krebs, Virginia Elec. & Pr. Co., Norfolk, Va.; Beatrice Derby, Ohio Public Service Co., Lorain, Ohio; Belle M. Gardiner, Ohio Electric Power Co., Sidney, Ohio; Gladys E. Ford, Chas. B. Knox Gelatine Co., Johnstown, N. Y.; Halline Spillman, Ochiltree Electric Co., Pittsburg, Pa.; E. F. Fyler, Page-Morris, Inc., Albany, N. Y.; John O Raplee, Electric Refg. Co., Louisville, Ky.; Thomas H. Beck, Collier's Magazine, New York, N. Y.; James L. Pause, Stuefer-Shannon, Inc., Minneapolis, Minn.; Gayb Little, Geo. Belsey Co., Los Angeles, Calif.; H. H. Smith, The Willis Co., Akron, Ohio; R. A. Sholl, Judson C. Burns, Philadelphia, Pa.; A. H. Johnson, The Hines Company, Baltimore, Md.; Miss Friedley, J. Spang Baking Co., Cleveland, Ohio; W. Jabine, Electric Refrigeration News, Detroit, Mich.; E. M. Gerahty, Lakeside Hospital, Cleveland, Ohio; Ada Bessie Swann, Public Service Elec. & Gas Co., Newark, N. J.; Jean Salisbury, Hotel Hollenden, Cleveland, Ohio; Dorothy Kirk, New York, N. Y.; Mildred Keene, Ohio Public Service Co., Massilon, Ohio.

"STIMULATES WORKERS"

GEORGIA EXPERIMENT STATION
Office of Director
Experiment, Georgia

October 31, 1930.

Wm. Jabine, Editor,
Electric Refrigeration News,
Detroit, Michigan.

Dear Mr. Jabine:

We wish to express our appreciation of the emphasis given the fruit refrigeration work of the Georgia Experiment Station in recent issues of the ELECTRIC REFRIGERATION NEWS. This stimulates our workers to greater success and we hope the final results will warrant the space that you have given the subject.

Yours very truly,

H. P. STUCKEY,
Director.

NEW CLEVELAND TAVERN

Cleveland, Ohio—Soda fountain and ice cream equipment are important items of the kitchen fixtures of the new Shaker Tavern, in the center of the exclusive Shaker Height development near Cleveland.

Though there is no service at the fountain, its products are sent on order to the huge Moreland Court Apartments, adjoining the tavern, which have living accommodations for more than one thousand residents. All ice cream comes from the tavern kitchen from a specially built Taylor freezer of Monel metal. The fountain, also of Monel metal, was installed by the Russ Manufacturing Company.

DETROIT

Engineers Discuss Quick-Freezing

(Concluded from Page 1, Column 5)

the side of those who do not believe that air circulation is necessary, and advocated a system of absorbing the heat in the side walls of the case before it has a chance to get through and into circulation.

The actual producers of quick-frozen meats then were heard from, Mr. Cockrell introducing Louis F. Thompson, of the Indianapolis Abattoir, the packing organization which has been conducting an experimental campaign in Muncie in the last few months. Mr. Thompson's company has been getting along thus far without display, using the simplest sort of storage cases. Disclaiming any liability to state at this point whether or not display is necessary, Mr. Thompson adroitly pointed out that a large proportion of his company's business is with the independent merchant, and the independent conducts much of his business over the telephone. A customer who telephones her order is not concerned with how the products are displayed in the store. He also said that, in his opinion, the elimination of display would save two-thirds of the cost of the average case. This figure was not challenged during the meeting, but after the meeting, and after Mr. Thompson had left to return to Indianapolis, a little symposium of casemaking talent declared that display should not be as costly as all that.

The letter from J. B. Rogers, general purchasing agent of Swift & Company, which appears on page 4 of this issue of the Refrigerated Food section, was read by William Jabine, editor of ELECTRIC REFRIGERATION NEWS. Although not written for the meeting, it was so pertinent to the subject under discussion that it was made a part of the proceedings.

Sinks and Wyllie

Two manufacturers of refrigerating units then had a chance to express their views through their representatives, R. W. Sinks of Frigidaire, and John Wyllie, Jr., of Kelvinator. Mr. Sinks made a strong plea for co-operation on the part of all those concerned, reminding his hearers that "more information is needed on the exact temperature for the retail store," thus reopening a matter which some of the previous speakers had evidently regarded as settled. Low temperature, constant temperature and minimum circulation were the three desiderata named by Mr. Sinks, who thus put himself on the no circulation side of the fence. In summing up, he repeated the plea of other speakers for low temperature cases at a price which the retailer can afford. He said:

"At the present time a small 8- or 9-foot case costs around $1,500 and does not afford the purchaser the necessary amount of storage space to justify this expenditure. If the question of price did not enter the picture, it would be a relatively simple matter to build a case that would meet all of the requirements. But unless it can be shown that there is from three to four hundred per cent more profit in handling frozen foods than in handling fresh products, the question of price still assumes large proportions. It would therefore seem that the most important question to be settled is the amount of display necessary and the ratio between display and storage.

"The application problem insofar as the refrigeration manufacturer is concerned is not a new one but one that is always with us. The same things are true of frozen foods that we find with all other new developments, that during the experimental period slight improvements on old methods are invariably tried out first. Gradually the necessity for radically improved methods are seen, with the result that hundreds of pet ideas are advanced and tried. Later a closer analysis is made, and with a better understanding of the problem, success is had to a more or less degree. However, all of this is expensive, since it is impossible for the refrigeration manufacturer to get on a production basis, stocking problems are also incurred which are expensive.

"In order to be a success, quick-frozen foods must be economically sound, and if for no other reason the equipment necessary to handle frozen foods in the retail store must be sold at prices comparable with the equipment used in handling fresh products of a similar nature. This means that the refrigeration equipment, as well as the case equipment, must be sold at a low initial cost and must be capable of operating on an economical basis."

Mr. Wyllie in discussing the application of Kelvinator units to low temperature cases neatly sidestepped the air circulation controversy by stating that his organization has found that both types of cases would work if the proper refrigeration equipment was used. He pointed out that it is the case manufacturer's job to design the case within certain well known limits, or if he wishes to go outside those limits, to consult with the unit manufacturer to discover the all-important fact of whether or not his case can be economically refrigerated. In certain cases the unit must be built in, and when that is the fact the unit manufacturer should be consulted at every stage of the proceedings. Just as Mr. Sinks had done, he declared that the makers of refrigeration units are ready to take care of well designed cases, and keep them at satisfactory temperatures.

Frozen Fruit

Frozen fruit then had its innings. D. F. Sampson, of the American Canning Company's research organization, told of that company's work in studying the distribution of frozen fruits in individual containers. The freezing of fruit is an old story to the canners, according to Mr. Sampson, who added that the experience in freezing that the canning industry has been gaining over a long period of years should be invaluable to those who are now freezing foods for the first time.

A. J. Rogers, who grows cherries on the eastern shore of Lake Michigan, and also manages the affairs of the Michigan Cherry Growers, who have been marketing their crop this year under the aegis of the Federal Farm Board, confirmed Mr. Sampson's statement as to the length of time the fruit growers had been freezing their product. He traced the progress of cherry freezing from its beginning about a decade ago, to 1930, when approximately 40 per cent of the country's cherry crop was cold-packed, a total of about 100,000 barrels. Considerable portions of the papers read by Mr. Sampson and Mr. Rogers will be printed in a future issue of the Refrigerated Food section.

The last two speakers were identified directly with the distribution of quick-frozen products. George Nitterhouse, of Indianapolis, has been one of the pioneers in the distribution of quick-frozen fish in the Middle West, and also has experimented in the freezing and marketing of other products, chiefly poultry. Mr. Nitterhouse therefore spoke, not from the standpoint of a man who is theorizing about quick-frozen products,

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A. S. R. E. DETROIT

(Concluded from Opposite Page)

but from that of a man who has actually sold them at a profit for several years. In his brief speech he outlined the differences in profit gained by the various classes of food merchants. The dealer in staple groceries must be content to make small profits spread over a great variety of items. The dealer in perishables, such as fresh vegetables and meats, demands long profits and quick turnovers. The perishability of their products makes this necessary. In Mr. Nitterhouse's opinion the dealer in quick-frozen foods will get a profit about half way between the other two. "I foresee a great future for quick-frozen products," he said, in closing.

George C. Rohrs, sales manager of the Atlantic Coast Fisheries, who was the last speaker, gave up most of his time to the reading of the remarks that Dr. Harden F. Taylor had prepared before he found that he could not attend the meeting. Before beginning to read, Mr. Rohrs referred briefly to the success with which his company is meeting in its sales campaigns in Syracuse and New Orleans.

Dr. Taylor's paper, which will be printed in a future issue of the Refrigerated Food section, contained much of the historical data in regard to refrigeration that Dr. Taylor has compiled as one result of his long years of research. It contained a warning of the danger to quick-freezing and other forms of low temperature preservation presented by the existence of the present "cold storage laws" in thirty states. He called on the industry to unite in an attempt to have the outworn features of these laws removed from the statute books.

The meeting closed with a motion picture, shown by E. D. Brigham, vice-president of the North American Car Company. The advance in the construction of refrigerated cars was evident to all who watched the picture.

Beginning with a dinner about seven o'clock, the meeting lasted until eleven, and in those four hours made a real contribution to the development of quick-freezing.

A

G. D. Allman, U. S. Cold Storage & Ice Co., Chicago; C. F. Alt, Armstrong Cork & Insulating Co., Detroit; R. O. Ashton, Dayton, Ohio.

B

A. P. Baker, Detroit Board of Commerce, Detroit; M. C. Baker, Parker Rust Proof Co., Detroit; Paul W. Baker, Wagner Electric Corp., St. Louis, Mo.; Arthur A. Baldwin, Holmes, Inc., Detroit; Arch. Black, Ferndale, Mich.; C. F. Belshaw, Dearborn, Mich.; Harry Bergholm, Electrolux, Stockholm, Sweden; E. W. Bernhard, L. H. Gilmer Co., Detroit; Herbert A. Bogart, H. A. Bogart Co., Toledo, Ohio; F. W. Brack, Electric Refrigeration News, Detroit; O. A. Brandel, Norge Corp., Detroit; Roger K. Braun, Kelvinator Corp., Detroit; E. D. Brigham, Jr., North American Car Corp., Chicago; Geo. B. Bright, Geo. B. Bright Co., Detroit; L. D. Burch, Kelvinator Corp., Detroit.

C

J. R. Cameron, Norge Corp., Detroit; R. F. Campbell, Campbell-Hill Co., Milwaukee; John L. Caren, U. S. Cold Storage, Detroit; John H. Caron, Brooke, Smith & French, Inc., Detroit; F. M. Cockrell, Electric Refrigeration News, Detroit; J. D. Colyer, Wolverine Tube Co., Detroit; G. N. Congdon, Electric Refrigeration News, Detroit; H. M. Cook, H. G. Bogart Co., Toledo, Ohio; L. G. Copeman, Copeman Laboratories, Flint, Mich.; Geo. W. Cox, Detroit Press, Detroit; R. H. Craig, Armstrong Cork & Insulation Co., Detroit; A. B. Curtis, Johns Manville, Detroit.

D

L. H. Darbyshire, Norge Corp., Detroit; Guy W. Dean, United Cork Co., Detroit; Gerald C. Denebrink, Armstrong Cork Co., Lancaster, Pa.; W. C. Dever, Whitehead & Kales, Detroit; R. W. Doeg, Kelvinator Corp., Detroit; R. C. Doremus, Geo. B. Bright Co., Detroit; Jas. J. Dorney, Westinghouse Co., Detroit; L. Z. Dreley, Kelvinator Corp., Detroit; John Drittler, Electric Refrigeration News, Detroit; C. O. Duevel, American Thermos Bottle Co., Norwich, Conn.

E

H. D. Edwards, Union Carbide & Carbon Chemical Corp., New York; H. W. Edwards, State Physics Dept., Lansing, Mich.; Dan. G. Ellis, Kelvinator Corp., Detroit; Fred. R. Erbach, Kelvinator Corp., Detroit.

F

P. E. Fay, Dry Ice Corp., Detroit; A. M. Fenwick, Dole Refrigerating Machine Co., Chicago; J. M. Fernald, Kelvinator Corp., Detroit; D. Z. Forry, Nicol-Ford & Co., Detroit; C. O. Frisbie, North American Car Corp., Chicago; Edward M. Fritz, Grand Rapids Cabinet Co., Grand Rapids, Mich.

G

Herbert George, Wood Conversion Co., Chicago; J. L. Gillard, Alaska Refrigerator Corp., Muskegon, Mich.; F. B. Green, Ottenheimer Bros., Baltimore, Md.; John A. Gustus, Valade Refrigerator Corp., Detroit.

H

C. H. Hall, Johns Manville Corp., New York; E. B. Hallihan, Westinghouse Electric Supply Co., Detroit; Edward Haug, American Showcase & Mfg. Co., Detroit; Harry Hayes, Absopure Corp., Detroit; D. P. Heath, Kelvinator Corp., Detroit; R. S. Hemmingsen, Johns-Manville Corp., Detroit; J. W. Hill, Campbell-Hill, Inc., Milwaukee, Wis.; W. H. Holmes, Holmes, Inc., Detroit; G. J. Hopkins, McCray Refrigerator Corp., Kendallville, Ind.; E. F. Hubacker, Norge Corp., Detroit; H. T. Hulett, General Electric Co., Cleveland, Ohio; R. M. Hyde, McCord Radiator Corp., Detroit.

J

Wm. Jabine, Electric Refrigeration News, Detroit; Norman B. Jackson, Ruddy Mfg. Co., Brantford, Canada; A. Martin Janasik, Universal Cooler Corp., Detroit; Fred. A. Johnson, Ruddy Mfg. Co., Brantford, Canada; J. B. Johnson, Kelvinator Corp., Detroit; G. M. Johnston, Universal Cooler Corp., Detroit; E. E. Jones, Campbell-Hill Co., Milwaukee, Wis.; E. S. Jones, York Heating & Ventilating Corp., Detroit; J. W. Jupe, Zero Ice Co., Norman, Okla.

K

Dewey J. Karkanen, Norge Corp., Detroit; Geo. R. Kingston, Frigidaire Corp., Detroit; J. M. Kisselle, Detroit; Geo. H. Kittredge, Geo. B. Bright Co., Detroit; Herman Kleist, Dole Refrigerating Machine Co., Chicago; O. Z. Klopsch, Wolverine Tube Co., Detroit; R. H. Knight, Celotex Co., Chicago; W. H. Knowles, Universal Cooler Corp., Detroit; Hugh J. Krampe, Armstrong Cork & Insulation Co., Lancaster, Pa.; Paul Kunkle, Norge Corp., Detroit.

L

M. J. Laurie, McCormick-George Co., Detroit; **T. J. LaFontaine, Westinghouse** Electric Supply Co., Detroit; W. L. Lambrecht, Euth-Lambrecht Co., Detroit; M. W. Lloyd, Austin Bement, Inc., Detroit; R. D. Lombard, **Holcomb & Hoke Mfg.** Co., Indianapolis, Ind.; **J. H. Lytle, Kroger** Grocery & Baking Co., Cincinnati, O.

M

John E. Maegely, Kelvinator Corp., Detroit; W. L. Malloy, Grand Rapids Cabinet Co., Grand Rapids, Mich.; Cyril J. Mauer, Whitehead & Kales Co., River Rouge, Mich.; C. R. McConner, York Heating & Ventilating Corp., Detroit; A. D. McLay, The Detroit Edison Co., Detroit; Harry Morrow, American Thermos Bottle Co., Norwich, Conn.; C. Morsbol, Copenhagen, Denmark; Emmet J. Mueller, Vilter Manufacturing Co., Milwaukee, Wis.; Glenn Muffly, Copeland Products, Inc., Mt. Clemens, Mich.; Gordon Muir, Holbrook, Merrill & Stetson, Detroit.

N

James W. Neil, American Thermos Bottle Co., Norwich, Conn.; Richard G. Nelson, Kelvinator Corp., Detroit; George Nitterhouse, Frigidized Food, Inc., Indianapolis, Ind.

O

Jos. M. Oberc, Standard Refrigerating Appliances, Detroit; H. S. Oderman, Detroit City Service Co., Detroit; J. J. Oderman, Detroit City Service Co., Detroit; Arthur H. Payson, American Thermos Bottle Co., Norwich, Conn.

P

Thos. S. Pendergast, Absopure Refrigerator Corp., Detroit; L. A. Philipp Kelvinator Corp., Detroit; A. V. Phillips, Kelvinator of Canada, London, Ontario; H. I. Phillips, Flintlock Corp., Detroit; H. A. Pollock, Westinghouse Electric Supply Co., Detroit.

R

J. D. Rankin, Du Pont Cellophane Co., New York; W. C. Rasch, Armstrong Cork & Insulating Co., Detroit; P. J. Reese, Wagner Electric Corp., Detroit; James B. Replogle, Jas. B. Replogle Laboratories, Inc., Detroit; E. H. Rhoades, Food Distribution, Chicago; N. C. Rice, Norge Corp., Detroit; John R. Rightmire, Wagner Electric Corp., Detroit; F. B. Riley, Standard Refrigerating Appliances, Detroit; O. A. Riley, Johns-Manville Corp., Detroit; J. G. Robertson, U. S. Cold Storage Co., Atlanta, Ga.; A. J. Rogers, Fruit Growers' Union, Beulah, Mich.; George C. Rohrs, Atlantic Coast Fisheries Corp., New York; Louis Ruthenburg, Copeland Products, Inc., Mt. Clemens, Mich.

S

D. F. Sampson, American Can Co., Maywood, Ill.; K. Schultz, Armour & Co., Chicago; R. J. Scott, Detroit City Service Co., Detroit; Colin M. Selph, Detroit Times, Detroit; E. E. Seymour, Great Lakes Terminal Warehouse, Detroit; W. T. Sherer, Sherer-Gillett Co., Marshall, Mich.; W. A. Shirk, Grigsby-Grunow Co., Chicago; R. W. Sinks, Frigidaire Corp., Dayton, Ohio; Gannes Slaytor, Gannes Slaytor, Inc., Detroit; Warren A. Sterling, Sterling, Wilson, Hamblen Co., Detroit; H. M. Stewart, McCray Refrigerator Co., Kendallville, Ind.; Wm. L. Stewart, U. S. Cold Storage, Detroit; S. Stoliker, Universal Cooler Co., Windsor, Ontario; H. W. Summers, Consumers Power Co., Grand Rapids, Mich.

T

C. R. Taber, Kelvinator Corp., Detroit; C. H. Tanger, Servel, Inc., Evansville, Ind.; Theron C. Tayler, Sand Lime Products Co., Detroit; Charles C. Thomas, Kelvinator Corp., Detroit; Louis F. Thompson, Indianapolis Abattoir Corp., Indianapolis, Ind.; Chas. W. Triggs, Wilmette, Ill.; H. A. Turner, McCormick-George Co., Detroit; T. Tuttle, Kelvinator Sales Corp., Detroit.

W

H. Walgenbach, Norge Corp., Detroit; H. Walters, Norge Corp., Detroit; F. R. West, Kelvinator Corp., Detroit; B. C. White, U. S. Cold Storage, Detroit; John Wyllie, Jr., Kelvinator Corp., Detroit.

Frozen foods were displayed in the case pictured at the right at the recent American Hotel Association convention in San Antonio. Neches Electric Co. and Swift set up the display.

REFRIGERATED FOOD SECTION

ELECTRIC REFRIGERATION NEWS

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Progress

JUST a week or two short of a year ago, the Detroit section of the American Society of Refrigerating Engineers held a meeting at which S. C. Bloom, of Chicago, unfolded a wonderful tale about the possibilities of quick-freezing. Most of those who listened to him were politely skeptical, and while they applauded him generously when he finished, felt that they had spent the evening looking into a sort of dream city.

On the evening of November 3rd, 1930, as chronicled on the front page of this Refrigerated Food section, Detroit's A. S. R. E. men gathered for another meeting at which quick-freezing was the principal subject of discussion. This time they talked in a matter of fact way about case design, refrigerants, marketing and other subjects, all concerned directly with quick-frozen foods. The *possibilities* of quick-freezing are no longer of interest. If any proof was needed that quick-freezing has passed the *possibility* stage, and not only has done that but has progressed beyond *probabilities* into the field of *actualities*, the Detroit meeting provided it.

No one who attended the meeting could well escape the conviction, so often voiced in the columns of the Refrigerated Food section, that the measure of success which quick-freezing achieves, and the speed with which that achievement is accomplished, depend largely on the production of a suitable display and storage case for handling quick-frozen products in the retail store.

Most of the speakers at Detroit addressed themselves directly to this problem. Those who were engineers could hardly do otherwise, and two or three, whose chief interest is in marketing, found themselves talking case and display problems.

One thing was evident. The makers of cases know pretty well now just what is wanted of them. The letter, which appears in another column on this page, was read at the meeting and helped to dispel doubts on that point. The methods of arriving at the recognized goal are still subject to dispute, and several points of variance turned up during the evening. The question of whether or not air circulation is necessary, which has been discussed in previous issues of the Refrigerated Food section, was referred to by several of the speakers, and there seemed to be considerable weight of opinion on both sides. If anything, the no circulation men were in the majority.

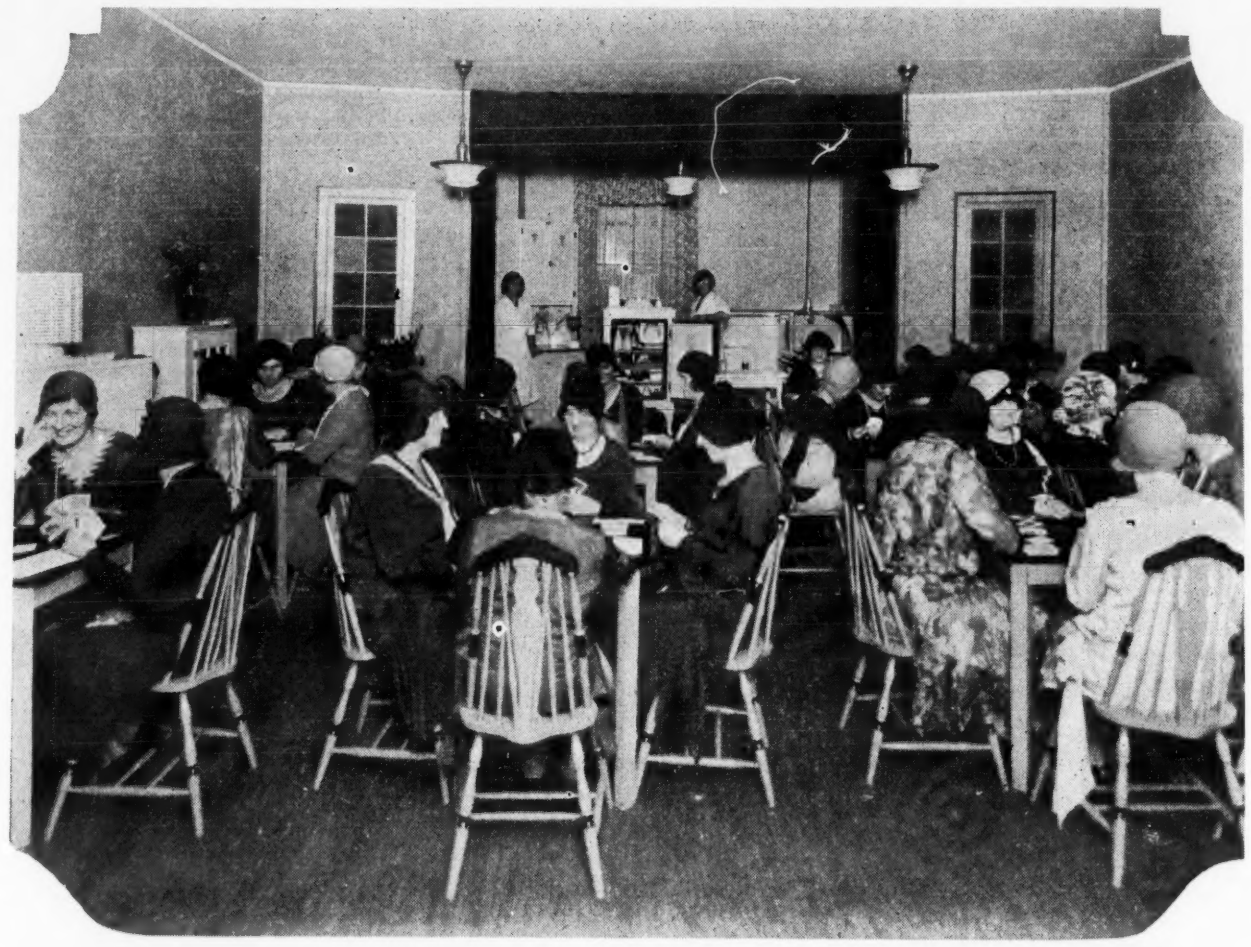
To display or not to display, also provoked diverse expressions of opinion. The eye worshippers were very sure that the only real way to sell quick-frozen foods is to display them first in all their glory. The non-display element didn't seem so sure of their ground, but strangely enough produced more actual facts and trends to bear out their point of view than did their opponents. The inutility of an expensive display case for the benefit of customers who call up and give their orders over the telephone, was a rather telling point made by one of the speakers.

The cost and quantity ratios between storage and display also uncovered differences of opinion. There was little agreement on that subject.

All of which would indicate that the designers, manufacturers and future users of low temperature cases are thinking, and thinking hard. They know that quick-frozen foods have arrived and that their arrival would be much more conspicuous in the eyes of the general public if there were plenty of suitable cases ready to handle them in the retail stores. The big chains are distinctly interested, but they must have facts not theories. Some of them were represented at the Detroit meeting and were looking eagerly for facts.

Standardization of display and storage cases, of either or of both, will come before long. And when it comes it will bring with it a wave of progress in the development of quick-frozen foods which will make the 1930 advance look like a mere ripple. The refrigeration industry has a job on its hands, but best of all it knows it, and a task which is recognized and understood, is well on its way to accomplishment.

Prospect Bridge



THIS model kitchen, operated by Phillip H. Harrison & Co., General Electric distributors at Newark, N. J., is the scene of almost continuous demonstrations. Here bridge parties are arranged by women's clubs.

Following the card parties, home service directors talk on the merits of electric refrigeration and demonstrate the making of various refrigerator dishes.

ANSWERED

SWIFT & COMPANY
Union Stock Yards
CHICAGO
Purchasing Department
October 23, 1930.

Mr. Wm. Jabine, Editor,
Refrigerated Food Section,
ELECTRIC REFRIGERATION NEWS.
Dear Mr. Jabine:

We read with interest your editorial under the heading, "Temperatures," that appeared in the August 27, 1930, issue of your papers.

Swift & Company, as the pioneer producer of Identifiable Packaged Frozen Meats, wishes to comment on the editorial with the following statements, which seem to us to be important at this time.

As the pioneer in the Frozen Package Meat Field, Swift & Company has conducted a great amount of research during the past years and as a result of this research has developed certain important facts regarding the best conditions for carrying frozen packaged meats.

Anticipating the desirability of improved refrigerated storage and display case facilities by the distrbutor of frozen meat cuts, and fully appreciating the refrigerated case manufacturer's position in the entire scheme, Swift & Company more than a year ago established a co-operative service with refrigerated case and refrigerating machine manufacturers. A great many manufacturers of this kind of equipment have availed themselves of the opportunities we have offered, to expedite the development of suitable equipment to meet the frozen packaged meat trend.

To these and other manufacturers, we have clearly stated our findings and our ideas to date, of the elements essential to the satisfactory refrigerated storage or display case.

Many manufacturers with whom we have co-operated have taken full advantage of our findings and have produced really low temperature cases suitable for the proper handling of these new products.

In the light of our present knowledge of the handling of frozen meat cuts, we take this opportunity to answer your specific question:

"What is the temperature at which quick-frozen foods should be kept while in the retailer's possession?"

Regarding meats, we have found that a temperature of zero degrees F. or lower is essential for the best preservation of frozen meat cuts, where the time of holding is longer than about one week. This becomes more important as the time requirement is lengthened.

When frozen meat cuts are to be carried for only a short period of time by the dealer before delivery to the consumer (as should be the circumstance when they are put on display in a dealer's display case), somewhat higher temperatures, namely, 10–15° F., are satisfactory. Under these temperature conditions meat cuts can be satisfactorily carried three or four days, which appears to be ample time for the selling out of any of these cuts that may be on display.

The statement in the preceding paragraph is based on the meats being in ideal (hard frozen) condition when put into the display or storage case.

We have recommended that meat products be held in a storage temperature of zero degrees F. or lower, and placed in the display counter only as needed, and that sales be made from the display section, in order to decrease as much as possible the time of product turnover in the warmer display section.

Another point that we have strongly emphasized to case manufacturers and refrigerating machine manufacturers is the matter of providing adequate, convenient defrosting apparatus, which will enable the dealer to quickly and conveniently defrost the refrigerating surfaces without the necessity of removing product from the case, and without an undue rise in temperature of the storage or display box. This is very important, as we know of instances where dealers find it necessary to remove the entire product content of their case and open all doors, to provide sufficient heat to defrost the refrigerating surfaces. This kind of procedure requires much time and considerable effort on the part of the dealer and is not satisfactory to him. him.

You understand, of course, that we are not experts in the manufacture of display and storage cases, or refrigerating machines, but have only attempted to point out some fundamental conditions which our experience to date has taught us it is necessary to recognize. Our further research may develop additional facts and conditions, and if such should prove the case, we will pass them on to the manufacturers of cases and refrigerating machines as soon as possible.

We trust that this letter will be of some assistance to you in answering questions that may be asked you such as that quoted herein.

Yours respectfully,
SWIFT & COMPANY.
J. B. ROGERS,
General Purchasing Agent.

CHERRY PIE

Traverse City, Mich.—Plans for making the famous Michigan cherry pie known to a wider circle of consumers are under way. The Michigan cherry growers have decided to back a small store or booth in the Chicago loop district, where cherry pies and frozen cherries will be sold. This store will be operated by an organization which has been selling cherry pie successfully from a group of roadside stands or "cherry huts" in the Michigan cherry region.

The Chicago establishment probably will have room for a few tables at which the customer may eat his cherry pie. It is expected, however, that the majority of sales will be to Chicagoans, who will take their pies or frozen cherries home with them.

RESTAURANT EQUIPPED

Bridgeport, Conn. — Downes Smith Company, 540 Fairfield Avenue, has installed a Leonard cooler of 22 cu. ft. capacity in the Park City Grill, State Street. A Frigidaire unit with 16 F coils provides refrigeration.

LEGIBILITY

WHEN the opprobrium that goes with any suggestion of "yellow journalism" was defied by the adoption of yellow paper for the Refrigerated Food Section last March, the selection was made for a reason explained at the time. Scientific investigation has indicated that black on yellow provided the most legible color combination and therefore is most grateful to the human eye.

An interesting confirmation of this decision is contained in the quotation from *Printer's Ink*, which follows. It was written in response to a question from a reader, who wanted to know what color would be best for use on a food product, a band to go around a cake being the particular wrapper under consideration. *Printer's Ink* says:

"In an article, 'Choosing the Right Color for the Package,' Richard R. Franken in *Printer's Ink Monthly*, of March, 1928, described an experiment conducted at New York University to test color preference for cake cartons. A group of men and women made the test and the order of merit method was used. The results of this test showed that yellow was first choice for both men and women, white second, and orange third. Green, red, blue, purple and black followed in order.

"In a similar test for color preference for fruit cans, yellow again won, with white second, orange third and green fourth. In a coffee carton test, orange ranked first, yellow second and red third.

"In choosing colors for cartons, it is always well to bear in mind legibility of color combinations, so that the correct lettering color will be chosen for the particular background color that wins the test. In this connection it is interesting to study a table determined by experiment made by M. Luckiesh and recorded in his book, 'Language of Color.' The table follows:

Test Results	Color of Type	Color of Background
1—most legible	black	yellow
2	green	white
3	red	white
4	blue	white
5	white	blue
6	black	white
7	yellow	black
8	white	red
9	white	green
10	white	black
11	red	yellow
12	green	red
13	red	green
14—least legible	blue	red

"It is surprising that, although yellow so frequently comes at the top or near the top of color preference test rankings, it is not more widely used. One reason for this is that few manufacturers give the proper attention to the importance of consumer tests before choosing package color combinations. Such tests are comparatively inexpensive, and if submitted to groups of sufficient size are accurate indicators of what colors consumers really prefer. For various illogical reasons many manufacturers follow a policy of consulting their own preferences or use colors because somebody tells them that those colors are best.

"A thorough preference test conducted under field conditions will give the manufacturer the one best answer to his question, 'What colors should I choose for my package?' and assure him that he has something which will be of permanent value based on scientific information, rather than upon hearsay or whim."

Small Containers Make Fast Freezing of Peaches Possible

CONTAINERS of various types and materials were used by the Georgia Experiment Station during its work with quick freezing during the last few months. J. G. Woodroof, who has been in active charge of the freezing operations, has been extremely anxious to test the qualities of the possible kinds of containers for frozen fruits. The results of his experiments are described in the bulletin, "Preserving Fruits by Freezing; I—Peaches," which was recently issued by the Experiment Station. That section of the bulletin, which deals with the subject of containers, is printed below.

In this section of the bulletin Mr. Woodroof points out the evident trend toward the use of smaller containers for the freezing of fruit, a trend that has a direct effect upon the type of container that can be used.

Throughout the development of the frozen fruit industry there has been a trend from large to small containers. For the past ten years size of containers has decreased from 40-gallon to 30-gallon, 20-gallon, 10-gallon, and to smaller packs. Earlier experimental packs of peaches for ice cream in Georgia were in 10-pound tinned containers.

The importance of getting the fruit frozen as quickly as possible after being prepared and to obviate the disadvantages of subsequent repacking frozen products from large into smaller containers, led to the development of one-pound containers for frozen fruits. It was at this stage of the evolution of the container of frozen fruits that the industry in Georgia was born. Experimental packs of peaches were frozen by the Georgia Experiment Station in 1925 in several types of containers, but all of them were about one-pound size.

Developments during the past year indicate that the industry will probably find the use of even smaller containers advisable. Four-ounce containers are popular at present. These are intended for individual serving. This type of serving has many advantages. The food reaches the consumer in the identical containers and in the exact condition that it leaves the packing plant. The sanitary problem is greatly simplified, thus rendering it much easier to prepare and serve a standardized sanitary product. Four-ounce containers will be especially popular for serving in hotels, cafes, dining cars and quick lunch stands but are less likely to be generally used in the home.

Three general types of closed containers are being used for frozen peaches in Georgia, and several types of wrapping material offer possibilities.

Paper Board Containers

Paper board containers are made in any desired size and may be obtained in the shape of tumblers, tubs, cups or cylinders. Each type is adapted for special use. Tumblers appear desirable for one-pound size pack, from which it is intended to serve four or more persons. They have disadvantages in that they are too small for the packer to get his hand into and pack the peaches; also the contents of the package have to be broken before being served. Tubs and cups of one-quarter pound size are especially adapted to individual serving. These appear to have fewer disadvantages than any type of container. One or two-pound cylinders are suitable for making disk sections. This can be easily accomplished by cutting the container and its contents at the same time, removing the bands of paper before serving.

Treating: The process of treating the paper board for protection against water, acid, cold and heat, varies with the kind of cup used. Some containers are made of a good quality paper board and no treatment is needed. Others are heavily coated with paraffin and still others are impregnated with paraffin.

Labeling: The label on a paper board container is put there in the process of manufacture and cannot be removed. This renders further labeling unnecessary but at the same time restricts the use of the container to that for which it was originally intended. The label may be as simple as the law allows—bearing only the name and address of the producer and the name and amount of the contents, or it may be very elaborate and display many colors.

Capping: There are four general methods of capping paper board containers.

1. Cylindrical containers are capped by slipping a cap of like material over the open end of the cylinder. This has an advantage in that over-filled containers can expand on freezing without breaking any seal; also at the time of serving the cap can be removed, a part of the contents taken out and the cap replaced without injury to the container or contents.

2. The friction top is very simple and capping it consists of mechanically inserting a disk within the open end of the tub, cup, or tumbler and adjusting it to set in a groove. The advantages are that the lids can be inserted very rapidly and efficiently and produce a water tight seal. The cap may be removed without damage to the contents, but the cap cannot be re-inserted.

3. A third method of capping is that of inserting a simple disk in the open end of the tub, cup or tumbler, then crimping the edges of the cup and sealing with paraffin. This method produces the most perfect seal, but it is slow, messy and requires a heated capping iron. When the seal is once broken, neither the cap nor the container permits reclosing.

4. A fourth method of capping is a combination of those described in "2" and "3." One simple disk is inserted as in the case of the friction top, then another lid is crimped with the edges of the cup but not paraffined. Both lids are mechanically inserted by the same machine, giving double strength and double insulation.

Paper board containers have advantages in that they are cheap, do not require labeling other than that which may be put on the containers in the process of manufacture, exclude most of the light and air, are easily and quickly capped and easily opened for serving. The objectionable features are that they are not air tight, nor transparent, and the material is a poor conductor, increasing the time of freezing as well as the time of defrosting.

Glass Containers

It is always desirable when possible to allow a customer to see the product before buying. Glass containers are especially suitable for this. The conditions to which frozen foods are subjected are unusual. It remains to be seen whether glass containers with qualities of being transparent, easily sterilized and with possibilities of second use are sufficient to warrant their use. Glass containers are objectionable in that they are easily cracked when subjected to extreme temperatures, high in price, heavy in weight, and difficult to label after being frozen.

Blown glass containers have a shoulder or neck by which they are held in the process of making. Any constriction whatever at the top is objectionable for frozen fruits. Containers made by this process should not be used.

Moulded glass containers can be made of any desired size, shape, thickness or color. In our experiments, moulded glass containers gave excellent results.

Capping Glass Containers: Glass containers may be capped with tin lids of the jelly mould type; or tin lids with screw top, or anchor tin lids capped under vacuum, or corks inserted.

Labeling Glass Containers: Labeling of glass containers is difficult. If the labels are put on before the pack is frozen, they stand chances of being removed while being handled in the freezing process. It is almost impossible to get small labels to stick to very cold glass. If the labels are large enough to encircle the containers, much of the effect of using a transparent container is lost. The label should be embossed on the lid.

Various Types Used

We have used six types of glass containers, under several combinations of conditions, including the use of syrup with vacuum and vacuum without syrup.

The following conclusions are drawn from our experiments with glass containers:

1. Peaches frozen in crystal glass containers oxidized more rapidly than in paper or tin containers, due to the presence of air plus light. However, oxidation is greatly reduced when the glasses are closed under vacuum.

2. The thickness of the glass appears immaterial in so far as resistance to temperatures is concerned. Very thin glasses have withstood temperatures as low as —50° F. Very thick glasses have broken when subjected to slight pressure due to overfilling.

3. Glasses should be shallow and flaring at the top to allow easy removal of the product. The top should be of the screw type or vacuum.

4. Glass containers admit a more attractive display of the contents than cardboard or tin containers. The number of sizes, shapes, designs, finishes and colors of glass containers is unlimited; and it is certain that some of the less readily oxidized fruits will sooner or later be frozen in glass.

5. The price of glass containers is about 1½ to 2 times that of cardboard.

6. A glass container possesses characteristics of durability; transparency, ability to be sterilized, and a simple hermetic seal. As containers for various food products they have proven popular.

Tinned Containers

Tinned containers have three qualities that are extremely desirable for packing frozen peaches. They do not admit light, are easily vacuumized, and have a high conductivity. The first two of these are of great value in preventing discoloration of the fruit, either before freezing, while frozen, or after defrosting. The third advantage renders it possible to freeze the fruit more quickly and economically, but at the same time allows it to thaw rapidly.

A great deal of research needs to be done to determine just how much, what kind of, and under what conditions, light contributes to browning of peaches. It is certain that exposure to light at a temperature near the freezing point is more conducive to browning of the fruit than at a temperature ten degrees lower.

(Concluded on Page 6, Column 1)

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Electric Refrigeration News
550 Maccabees Bldg., Detroit

CONTAINERS

(Concluded from Page 5, Column 3)

It is also proven that the more nearly vacuumized a container the less is the detrimental influence of light.

Vacuumization is the removal of air or oxygen from a container. Obviously oxidation cannot take place in the absence of oxygen. If it were practical to produce a perfect vacuum, the greatest problem in freezing of peaches would be solved. Our investigations along this line are being carried on in co-operation with commercial companies and data are not yet ready for publication.

Aluminum Containers

Aluminum offers very nearly the same advantages as tin as a material for containers. It is very light, can be vacuumized; the material has a high conductivity, and seems well adapted to preserving contents that do not give an alkaline reaction. It is too early to give definite results from samples frozen in aluminum cans. Bidault and Blaignon reported promising results from experiments with meats canned in aluminum.

Wrapping Materials

Our results for several years have shown that frozen peaches should be packed in closed containers, and that best results are obtained when all of the pieces are completely covered with syrup. Figs, cantaloupes, berries, and other fruits seem not to require these conditions, especially when frozen by the "instant freezing" method. We have used one or more of these fruits in combination with peaches with satisfactory results, and are discussing wrapping materials especially as they apply to frozen fruit mixtures.

Vegetable parchment is stronger wet than dry, oil proof wet or dry, contains no sizing, loading, artificial coloring or other foreign matter. It is flexible, translucent, and has no taste or odor.

Glassine is a flexible, highly transparent, grease proof, hydrated, cellulose product which can be had in any size or shape. Glassine may be used as a wrapper for frozen blocks of fruit or made into small containers.

Waxed glassine combines the good features of glassine and waxed paper. It is the most transparent wrapping paper known, and when waxed, makes a waterproof and grease proof wrapper.

Waxed paper is made by applying melted wax to paper. It is odorless, tasteless, colorless and has a high melting point. Being water proof, it gives promise of becoming a wrapping material for frozen food when it is desired to exclude some light.

Visking is a new cellulose product which can be made into seamless tubes of any desired length. The tubes are filled, frozen, and cut into sections of any desired length.

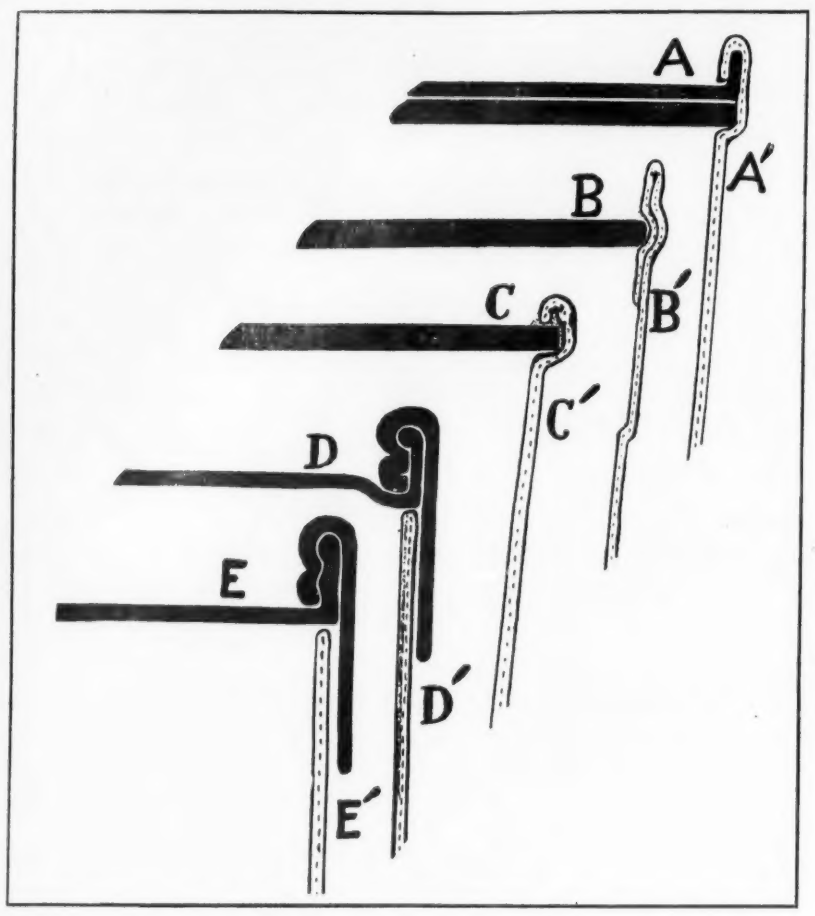
Cellophane is transparent wrapping material which gives full protection to the product. It is extensively used as wrappers for candies, dried fruits and cigars and has recently been adopted by meat packers for wrapping cooked or frozen meats. The use of this material in the field of frozen fruits is very promising. It may be obtained in sheets of any size in several different qualities; also in seamless tubes of several sizes. It is brittle at very low temperatures.

Metal foil is usually made of aluminum or tin and has most of the properties of cellophane except transparency. In fact, it gives absolute protection against light which seems very desirable in wrapping frozen fruits which oxidize readily, as peaches, pears, nectarines, and others. It is not brittle at very low temperatures.

Corrugated Storage Boxes

A quality desired in all of the containers discussed above is high conductivity. This is desired in order to get the contents frozen as quickly as possible. At the same time there is required an outer container of extra low conductivity to insulate the contents and maintain a low temperature during handling and transportation. Corrugated board, because of its trapped cells of dead air, appears to be, for its cost, one of the most efficient insulators known. Double-wall corrugated boxes are suitable for shipping samples of frozen fruits many hundreds of miles if packed with solidified carbon dioxide. Corrugated boxes are made in any size but are practically always rectangular in shape.

Types of Cap Fittings



Types of cap fittings for paper board containers.

(A) A double cap and a crimp, which makes a very close fit.

(B) A friction top, which is easily inserted or removed.

(C) A crimped and wax sealed top, similar to tin cans.

(D) and (E) Slightly different types of lids which are easily slipped over the top of the container.

A′, B′, C′, D′, and E′ respectively indicate the position of the side of the containers to which the caps are fitted.

TAMPICO

To Have Modern Cold Storage

Mexico City, Mex.—Application for a concession to establish a large and modern cold storage plant for fruits, vegetables, meat and dairy products, has been made to the municipal government of the City of San Luis Potosi, capital of the state of the same name, by a group of Tampico provision merchants. The refrigeration plant will represent an investment of 200,000 gold pesos (approximately $100,000).

All perishable products of the State of San Luis Potosi will be stored in the plant during dull market periods, it is understood. The plant will function along lines similar to the plant that will be built by agriculturalists of the State of Guanajuato in the city of Leon, the state capital. The Leon plant will be installed by the Mexican Autorefrigeration Corporation, which handles "Frigidaire" exclusively in this territory. Plans for the plant have been forwarded to the factory in Dayton, Ohio. The plant, which will be in service the early part of next year, will cost upward of 200,000 pesos (about $100,000).

BRIDGEPORT

Likes Swift's Frozen Cuts

Bridgeport, Conn.—A decided improvement in volume of quick-frozen meat sales is reported by Vincent A. Glynn, manager of Bridgeport branch of Swift & Company. A number of merchants in the city are sending in repeat orders for certain of the Swift Identifiable cuts, he says. As yet no freezer cases have been installed, display being handled in the ordinary cases.

"Steaks, chops and legs of lamb are the best sellers to date," Mr. Glynn says. "The fact that repeat orders are coming in indicates that the frozen cuts have passed the stage of an experiment in Bridgeport, and are definitely being sold and in increasing quantities, despite the lack of proper display equipment."

Several markets in the city are said to be contemplating the installation of freezer cases, preparatory to handling of the frozen foods on a large scale.

MIAMI FOOD STORE BUYS FRICK EQUIPMENT

Miami, Fla.—The Dade Refrigerating & Engineering Co., 2160 N. W. 1st Ct., has just completed the installation of Frick refrigerating equipment in the Walker-Skagseth Food Stores, Inc., 56 N. E. 1st Street.

The equipment comprises an eight-ton self-contained automatic Frick machine for keeping the separate cooling rooms and display cases at different required temperatures at all times. The building occupied by Walker-Skagseth has been remodeled and the refrigerating unit was placed at a cost of $12,000.

TESTING OF ICE CREAM MADE EASIER

Lincoln, Neb.—Prof. L. K. Crowe, of the Nebraska State University, has invented a simple device for testing ice cream. The professor's invention is built on the plan of the Babcock cream tester, using two acid "reagents" in a simple process. The new method, according to Professor Crowe, is of special interest to ice cream manufacturers where the law specifies a certain amount of butterfat in the ice cream.

Government Bureau Describes Carbon Dioxide Ice

THE following data in regard to carbon dioxide and carbon dioxide ice have just been issued by C. C. Concannon, chief of the chemical division of the United States Bureau of Foreign and Domestic Commerce. The study of the present position of these products in the industrial field was made by H. O. Moraw, who is attached to the chemical division of the Bureau. It reviews the recent and rather spectacular development of the product and gives a list of the uses that are being made of it. Its application to the field of refrigeration is reviewed in the bulletin, which is printed below in full.

Description—(Gas) Carbon dioxide, CO_2 (or carbonic acid gas), is a clear, colorless gas with a pungent odor and acid taste. (Solid) A white marble-like substance of the consistency of ordinary ice, having a temperature of —104° F. to —110° F.; evaporates at a rate depending on its surroundings into a pure inoffensive and invisible gas that is neither poisonous nor combustible. About 1.5 times as heavy as water.

Source—(Gas) Present day commercial sources of carbon dioxide, in the order of their importance, are coke process, by-product of chemical processes, fermentation processes, and lime kilns. Like all other raw materials, the carbon dioxide in a given locality may be utilized from a number of other sources, depending upon its availability at a low enough cost. An illustration is the conversion of this gas, near Tampico, Mexico, obtained from natural gas wells, into solid carbon dioxide for refrigeration of freight cars used in transportation from the southwest to the Chicago and eastern markets in 1930. Recovery of this gas from fermentation commenced on a substantial scale only in 1930, when 120 tons daily were contracted for a plant in the Middle West.

Uses—(Gas) According to unofficial estimates prior to the advent of the solid product, about 90 per cent of the carbonic acid gas produced in the United States in liquified form was used in carbonating beverages, the remaining 10 per cent being divided among other uses, including baking powder and confectionery, in refrigeration processes, and as a fire extinguisher, and as an ingredient in fumigants. (Solid) Many uses have already been established for solid carbon dioxide. One of the largest of these uses is the ice cream industry, most of the important distributors having converted their trucking equipment to allow for its use. Solid carbon dioxide has a number of advantages over water ice, chief among these being its greater reserve refrigerating power, due to its low temperature of 110° below zero. Although this has long been known, only in recent years has progress been made in the economical utilization of this unusual reserve for heat absorption. Its unique feature of dryness or freedom from residue on melting permits its use in delivering goods in cartons or other non-returnable containers for which water ice is not suitable. When properly used, these packages require as little as 5 per cent as much solid CO_2 as ordinarily packages require with water ice. Carbon dioxide ice by its evaporation surrounds itself with an atmosphere of carbonic acid gas, which is essentially a bad conductor of heat, and which has the further advantage of inhibiting processes leading to putrefaction, whereas water ice surrounds itself with water—a relatively good conductor of heat and often an accessory to putrifying processes.

If used for refrigeration in a manner similar to water ice, it is about twice as efficient, but if advantage is taken of the insulating qualities of carbon dioxde gas given off on melting, much higher efficiencies can be obtained. In this way a given quantity of carbon dioxide gas has been found to do the work of 15 times its weight of water ice. Considerable research and investigational work is under way, with a view of adapting this product to various refrigerating purposes. The use of this product is promising for refrigeration in new fields and in supplementing the use of other refrigerating methods. Economic considerations must determine whether or not the product can be used in certain channels of the refrigerating field. Already it is well established in many fields as a portable refrigerant in transit. Other applications of carbon dioxide ice, which have been developed, include its use by plumbers for freezing water mains; hardening of golf balls for machining; substitute of liquid air in radio industry; fumigation wth ethylene oxice; as an aid in embalming; transportation of ice cream, meat, fish, cheese, milk, flowers, mushrooms, and quick-frozen food by trucks or in cartons.

Grades—Pure liquid CO_2 99.5 per cent.

Containers—(Gas) Liquid, in steel cylinders.

Production—The Bureau of the Census reports production of carbon dioxide gas in the United States as follows:

	1927	1925	1923	1921	1919
Number of establishments	49	44	45	43	42
Short tons	37,132	29,860	25,549	27,308	29,885
Value	$6,048,474	$5,128,441	$4,992,373	$6,374,819	$6,574,250

No official figures are available on solid carbon dioxide, but estimates are as follows: It is reported that the largest producer in 1929 manufactured nearly 14,000 tons as compared with less than 5,000 short tons in the previous year. This producer, operating plants in 18 cities, and warehouses in 9 cities, with additional plants under construction, expected to have summer production in 1930 at the rate of nearly 300 tons per day. It is estimated that 1930 production of solid carbon dioxide alone will be as large as the total liquid CO_2 production in 1927.

Exports—American producers export carbon dioxide to some foreign markets. The trade was separately segregated in "Foreign Commerce and Navigation of the United States" for 1928, as reported below, but after that year the quantities and destination of exports were not recorded. Exports of carbon dioxide from the United States in 1928 went to the following countries: Jamaica, value $218; other British West Indies, $315; Cuba, $17,225; Dominican Republic, $1,183; Netherlands West Indies, $144; $1,183; Netherland West Indies, $144; Haiti, $1,462; French West Indies, $39; Virgin Islands, $143.

Prices, Producers and Dealers—The market price of carbon dioxide is quoted in the following trade journals: "Chemical Markets," 25 Spruce Street, New York City; "Oil, Paint and Drug Reporter," 12 Gold Street, New York City. The Bureau of Foreign and Domestic Commerce does not compile lists of firms engaged in domestic lines of industry, but the following commercial directories on file in the Bureau and many public libraries carry a listing for carbon dioxide liquid and solid, or the publishers could supply names of producers upon request; "Drug and Chemical Market Buyers' Guide Book," 25 Spruce Street, New York City; ""Oil, Paint and Drug Reporter, Green Book," 12 Gold Street, New York City; "Chemical Engineering Catalog," 19 East 24th Street, New York City.

The Compressed Gas Manufacturers' Association, Inc., 120 West 42nd Street, New York City, would probably supply, upon application, a list of the member companies producing carbon dioxide.

Tariff—Information concerning rates of duty on imports into the United States can be obtained from the Customs Service, Treasury Department, Washington, D. C.

Foreign News on Carbon Dioxide—News on the development of carbon dioxide and carbon dioxide ice in foreign countries is published in the weekly publication of the Chemical Division, "World Trade Notes on Chemicals and Allied Products," in which a number of items have appeared. Copies of this publication are on file in the Bureau, at Washington, or the various branch offices.

Publications on Carbon Dioxide and Carbon Dioxide Ice—Problems of Rapid Freezing, H. F. Taylor, "Food Industries," April, 1930; Freezing of Fruits and Vegetables, H. C. Diehl, "Food Industries," April, 1930.

"Manufacture of Carbon Dioxide," "Journal of Industrial and Engineering Chemistry," October, 1928, p. 1019; 419 Fourth Avenue, New York City.

"Industrial Gases," by Greenwood, gives process for preparing carbon dioxide from gasses from lime kilns, etc.

For additional references see "Industrial Arts Index" and "Chemical Abstracts."

For information on various phases of compressed gas industry, communicate with the Compressed Gas Manufacturers Association, 120 West 42nd Street, New York City.

New Equipment Designed For Quick-Frozen Foods

New York, N. Y.—The equipment for quick freezing made by the Quick-Freeze Corporation of this city has been the subject of much curiosity since that organization's entrance into the field was announced several months ago. Details of this equipment which have just been made public indicate that the inventors, G. R. Fennema and F. X. Burke, have incorporated in their apparatus a number of new features.

A description of the Quick-Freeze Corporation's new equipment follows:

It is a double-contact system in which the product to be frozen is held tightly between two sides of a split-mold, the contact surfaces of which are either shaped to conform closely to the outline of the product, or else, where natural shape does not have to be retained, the surfaces are designed to carry out plans for effective packaging, storing and displaying. Products can be frozen either naked or wrapped, or in containers.

In the case of extremely irregular products, such as poultry, whole fruit, legs of lamb, hams, etc., the inner surfaces of the mold parts are shaped to conform to the outlines of the product. In the case of fish fillets, bellies, roasts, large whole fish, etc., the surfaces are either flat or slightly shaped to give the desired contact and, by means of the pressure exerted, reduce the thickness to be frozen.

Heat Dissipation

One section of the mold is carried in contact with rapidly flowing, low temperature brine. The other section forms a pressure cover and is provided with three distinct means of heat dissipation: (1) conduction to the sides of the brine-contact part of mold; (2) conduction through overhanging finned lugs directly into the brine, and (3) radiation to a low temperature surface close to which the molds travel. There are supplementary features in both the upper and lower parts of the mold which add to the rate of heat transfer and make possible rapid speed of freezing, using temperatures of the middle range where the economy in the production of the required primary refrigeration is high.

The features in the lower mold section have to do principally with the increasing of area of contact between the product and the mold, and between the mold and the cold brine. The former is accomplished by the shaping of the inner surface to conform as nearly as practical to the entire surface of the product, by having projections from the inner mold surface reaching up into remote parts of the mass to be frozen, and by roughening the surfaces which come in contact with the product. The latter is accomplished by the mere shape of the mold, extended as it is compared to a flat freezing surface for the same product, and by employing irregularities such as spurs or ridges which multiply the brine contact area several fold over that of a smooth surface.

Some of the features in the upper mold section are similar; the inner surface being extended and broken up to give greater area of contact with product, while the outer surface is provided with irregularities so as to increase the radiating effect to the various cold surfaces above and beside the cover. In order to intensify this radiating effect, the surfaces used are of a low reflecting value but high radiating and absorbing values. The use of good radiating and absorbing surfaces in both the upper mold section and the very cold brine tank above the flume, together with the close spacing of these surfaces, gives a considerable heat transfer which becomes an appreciable aid to the main freezing—contact freezing. This upper brine tank is shallow and covers the entire upper section of the machine. It lies just below the top insulation. Some radiating effect exists also between the pressure section and the sides of the main mold. Radiation is said to increase the effectiveness of the molds by about 25 per cent.

Direct Contact with Brine

The upper mold makes direct contact with the brine by means of cast-in conducting bars of heavy cross-section which extend over the side of the molds and some distance down into the brine. The lug tapers as it goes down into the brine. Here it has thin, semi-circular plates reaching out parallel to the brine stream. The high conductivity of the lug and its large area of contact with the brine result in rapid heat transfer.

In the case of some molds there is contact maintained between upper and lower parts, either by means of specially designed hinges or through close-fitting crowfoot lugs. To dissipate the heat thus conducted to the edge of the mold, there are some additional ribs nearby extending out into the brine.

In most cases the molds are made of cast aluminum or aluminum alloy, heavy sheet aluminum, Monel metal, special non-corrosive steel, or heavily tinned copper. In a few cases galvanized iron is employed.

In freezing hams, large fish in-the-round, poultry, legs of lamb, etc., the cut to be frozen is dropped into the lower section of the mold and the pressure section is forced into place. This pressure eliminates air voids and brings a maximum of meat surface into intimate uninterrupted contact with the quick-freezing mold surface. In handling these large whole products, only two or three sizes of molds are provided to care for variations in weight, for any product or variety of products being frozen. In the unusual cases, the extreme weights are accommodated in two or four odd-sized molds. The elimination of multiplicity of mold sizes is made possible largely by the pressure which causes off-size products to conform to the mold surface. The machine is designed to turn out the entire range of weights that might prevail within the class of products for which it is planned.

Freezing of Small Fish

The freezing of bait, small fish in-the-round and medium fish in-the-round can be accomplished by pressure freezing in blocks of convenient size. These blocks can be nested into large cubical masses for space saving and convenience in storage and for ease of glazing or moisture-proof encasing. Air voids are reduced by the split-mold pressure.

The mold sections are conveyed through the insulated freezing flume in a single run. The molds are conveyed through the flume on a conveyor. It is not necessary to use long runs or to make turns.

The brine is sent through the flume at high velocity in order to dissipate the heat which is conducted to the brine through the walls of the mold. This prevents the formation of a stagnant film of warm brine. The high brine velocity has the effect of stretching this retarding film out to extreme thinness.

The high velocity is attained by using a steeply sloped flume through which the molds are conveyed. The slope is just enough to give a balance between friction head and velocity head, resulting in uniform flow. The brine is spilled into the entering and over a wier and from the discharge end is carried back by an impeller system in a deep narrow return tank. The impeller builds up the required head for recirculation.

As the mold comes out of the freezer it is passed through a short defrosting bath, the temperature of which can be either that of the water supply or slightly heated. The time of this bath is regulated to prevent appreciable defrosting of the product and yet to expand the mold and cause it to release its adherence to the frozen surface of the product. If the product is separated from the mold surface by wrapping material, the defrosting operation is eliminated or reduced to a flash-dip. In the case of nearly all products the finished shapes are lifted from the mold by means of the pressure cover, to which the frozen pieces adhere long after they are free from the lower mold. The group is then placed into a set of containers, in which they are to be marketed. Then soon defrost. Later the cover is removed and the final seal made on the container. Thus the food is not touched by hand in any of the freezer operations.

Molds for Poultry

In the freezing of poultry, for instance, the work is first segregated as to kind of poultry, i. e., broilers, fryers, fowl, etc. Taking broilers as an example, one mold size will handle approximately 50 per cent to 85 per cent of the output. The weight grades vary from 12 lb. per dozen to about 24 lb. per dozen, with an exceedingly small percentage over 24 lb. per dozen. The bulk of the production is in grades varying from 15 lb. per dozen to 20 lb. per dozen. These are accommodated in one mold. Only a few molds of the two extreme sizes are necessary to handle the birds under 15 lb. per dozen and over 20 lb. per dozen.

In the freezing of individual fillets and steaks of fish and retail cuts of meat, or bulk products in blocks or in containers, the uniformity of thickness or uniformity of size are of great help. Fruits, vegetables, seafood, meat products, eggs, dairy products, nuts, etc., are easily accommodated. Products to be marketed in waxed paper cups or similar containers can be frozen in the container or first frozen in a mold the shape and size of the container (either naked or in wrapping material) and then inserted in the container.

The lowest practical minimum of brine temperature is probably minus 35 degrees to minus 45 degrees F. A much more economical and less troublesome temperature is approximately minus 20 degrees F. This brine temperature can be maintained in an ammonia system with a suction pressure of zero lbs. gauge (atmospheric pressure), which means an ammonia temperature of approximately minus 28 degrees F.

If the user has a plentiful supply of refrigerated brine at zero degrees F., it is possible for him to use this equipment for quick-freezing of most cuts.

The usual brine cooler system is employed to cool the brine, but its circuit is independent of the main circulation. The brine cooler gets enough volume, taken out of the tank at the disharge end of the flume, to assure proper cooling. The cooled brine is then delivered to the upper shallow tank which forms the principal radiating surface. The brine cooler is not an integral part of the quick-freeze equipment.

One of the features of the system is an arrangement designed to eliminate frost formation on any of the parts of the apparatus. The frosting-up is to be prevented by entraption of the cold air within the entire confines of the insulated space of the machine. The small quantity of moisture carried into the space in company with the molds is taken up by the brine stream which enters from the brine cooler at the lowest temperature of any element in the system.

For freezing bulk products in containers, either for retail or wholesale trade, the Quick-Freeze Corporation has an arrangement which makes possible a freezing time of 1½ hours to 2 hours for containers holding 30 lbs. of product.

The control of freezing time is one of the most important characteristics of the machine. The reduction gear and the variable speed drive make possible the setting of the conveyor speed rate. The freezing time of the products can be pre-determined and due allowance made for slight variations and for a factor of safety.

Production Methods

If the production is heavy and many different products of various weights are being frozen on a vast scale at the same time, as in the case of a large meat packing plant, they can be carried through in line-production to various flumes, each of which handles a single product. If the production is on a moderate scale, only one flume need be operated and the conveyor speed on this can be set to conform to the freezing time of the product that is being handled at the moment.

For extremely small installations, as often used during the early stages of production or field research to determine market facts, it is often advantageous to use a batch-freezer instead of the continuous one. In this case, of course, the time must be set by the supervisor or operator. It can also be controlled mechanically.

The Quick-Freeze Corporation has its factory at 55 Oak Street, Bayonne, New Jersey, where the units are manufactured complete, up to and including connections for the brine cooler system, but it does not manufacture primary refrigerating equipment, brine coolers, pumps, etc. The units are fully assembled and operated before shipment.

G. E.'s POPULAR WITH STUDENTS

Cleveland, Ohio—Electric refrigeration has just been installed in the new East Cleveland Junior High School on Terrace Road, East Cleveland. A total of ten General Electric refrigerators were installed, the units ranging from water coolers to large size commercial models.

In the main cafeteria, a General Electric, C-450, with two fronts was installed. This model has doors opening on both sides and accelerates service. In the salad preparation room, a C-600 has been installed, while two PL-17's were placed in the main kitchen in the basement. A General Electric S-62 was placed in each of the two domestic science class rooms, while the teachers' cafeteria also was equipped with an S-62. In the main cafeteria, two DP-3 water coolers were installed, and in the teachers' cafeteria one DP-1 water cooler.

In line with the modern diet trend the school lunch room has given salads and perishables a conspicuous place on the school menu. The school building, which is of the colonial design, will have an ultimate capacity of 2,500 students.

The sale of the ten General Electric units was made by G. J. McBride, of the Cushman Refrigeration Company, Cleveland distributors.

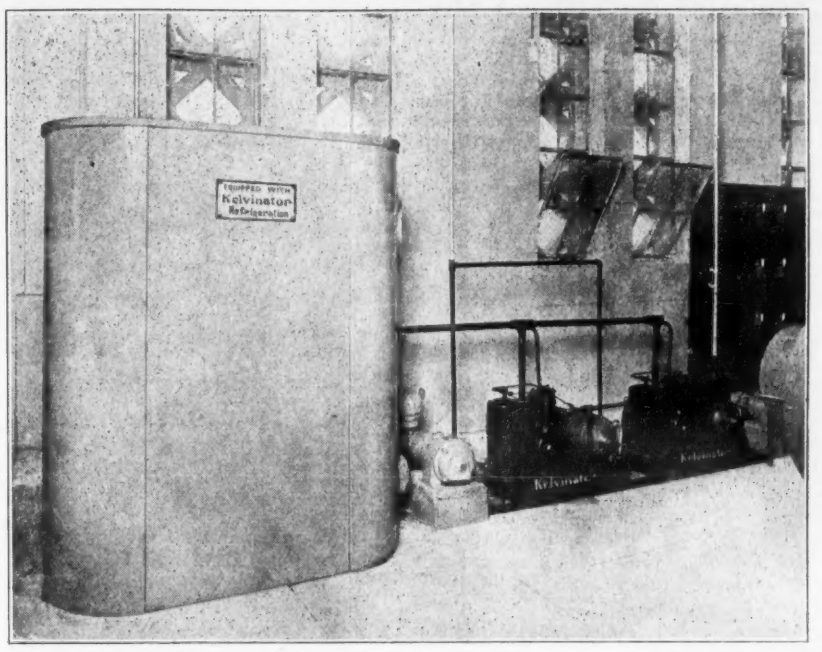
WAREHOUSE EQUIPPED WITH REFRIGERATION

Cincinnati, Ohio—Frigidaire Sales Corporation has just equipped the Cincinnati Wholesale Grocery's new warehouse.

A large storage room, 21x23x10-6, is used for storing cheese, smoked sausage, dried fruits, nuts, nut meats, and other perishable products. The smaller storage room, 15x23x10-6, is filled with butter, oleomargarine, eggs, etc.

The Frigidaire installation consists of 15-63F coils, 10-570 F coils, 5-C one h. p. compressors. Frigidaire also provides water cooling for the general offices and warehouse.

Bringing the Spring Indoors



Los Angeles, Calif.—Cool, spring water is one of the inducements offered by Banks-Huntley Company in its new building recently completed here. Particular attention was paid to drinking water, and it was decided to furnish tenants with cool, spring water instead of the city supply. To meet this request, Mr. Grady of the commercial department, Kelvinator-Los Angeles Co. worked out a design for special equipment and obtained the order.

Low side or cooling tanks were constructed by the Consolidated Engineering Company of Los Angeles. The condensing units are two WR-40's, cooled by water circulated by the small pump shown at the extreme right. This pump is wired so as to start and stop with the condensing units. The entire water-cooling plant is in the machinery penthouse on the roof.

F. L. Carley, commercial manager of Kelvinator-Los Angeles, supervised the installation of the equipment.

The cool spring water will be readily appreciated by the tenants in the building. And on warm days the Kelvinators will have a big job of keeping the water at the temperature that refreshes.

FLINT MARKET

Dominated By Efficient Meat Department

Flint, Mich.—The central market idea has taken hold here in Flint. Ever since the Citizens' Market was opened in the heart of the business section, about two months ago, its popularity has been increasing. The convenience of being able to purchase nearly all kinds of foodstuffs under one roof makes a strong appeal, especially when free parking is provided next door, as is the case here.

Conspicuous in the center of the Citizens' Market is the meat department, which consists of an island surrounded by 87 feet of refrigerated showcases made by Hussmann and refrigerated by Lipman equipment, manufactured by the General Refrigeration Company. In addition to this equipment for handling meats, there are a fish case 12 feet long, and a 30-foot dairy case in other parts of the market.

Thomas Mansour is the leading spirit in the market organization, and in ordering his equipment he looked ahead to the days when packaged quick-frozen meat might be sold. He specified equipment that, with slight alterations, could take care of low temperatures. At present a temperature of 35 degrees F. is maintained.

As a matter of fact, the first step toward packaged meats has been taken at the Citizens' Market, for all of the meat cutting, with the exception of a little slicing and separation of chops, is done in the well-lighted basement. The cuts in the refrigerated cases are all ready to take home as soon as they have been weighed and wrapped.

And the wrapping has furnished the greatest problem thus far. Seemingly a simple operation, it has failed to keep pace with the demand, and the space allotted to this necessary part of the work has proved too small. It also is space that is almost too valuable to devote to that purpose.

On busy Saturdays the Citizen's Market meat department handles more than 4,500 customers. It is necessary for the manager, P. H. Hayner, to employ from 15 to 18 butchers and 26 men in all. Although they are easy to find at this time when work is so scarce, Mr. Hayner is a little dubious about the future, when business is better and his extra men are back at work at their regular jobs in the automobile factories. He regards packaged meats, either quick-frozen or fresh cut, as one of the possible solutions of that problem when it arrives, as well as of the wrapping problem which already has inflicted itself upon him.

The Lipman equipment in the basement consists of a six-ton machine, which provides refrigeration for all of the cases on the main floor, for the soda fountain, and for the walk-in meat cooler downstairs.

MIAMI ORGANIZATION TO ENGAGE IN QUICK FREEZING

Miami, Fla.—The Miami Fish and Ice Company, Inc., is planning to install quick freezing equipment and extend its activities by freezing fish for consumption in the north. John G. Crosland, president of the company, has not yet decided just what type of quick freezing machinery he will buy, and of course is postponing further development until that question has been settled.

REFRIGERATOR CARS IN DEMAND

Mexico City, Mex.—Tomato and other vegetable producers of the Mexican northwest have forwarded a request to the Southern Pacific Railway of Mexico that at least 1,500 refrigerator cars be requisitioned to move the crops of these vegetables to the United States. Practically all the Mexican vegetables will enter the United States by way of Nogales, Ariz. The movement will start about the middle of November.

Fast and Furious

The refrigerated cases are there behind the crowd. Dr. Claude C. Schaffer in center.

FISH STEAKS

Go Well in New Orleans Campaign

New Orleans, La. — Following the opening drive in Syracuse, New York, for the introduction of Nordic fish steaks, the Atlantic Coast Fisheries Company of New York moved into New Orleans on October 9, for the second of its experimental advertising and merchandising campaigns.

New Orleans was selected, company officials declare, because of its epicurean taste and the fact that it is a seafood producing center. In connection with the campaign a special force of salesmen was scattered throughout the New Orleans trading area. They were under the immediate command of Russell Yelton, western sales manager for the Atlantic Coast Fisheries, who was relieved of his regular duties to handle this campaign. Later, George C. Rohrs, general sales manager of the Atlantic Coast Fisheries, went to New Orleans and took personal charge.

A 12,000-line advertising campaign was placed in the New Orleans Times Picayune. This was backed up with dealer tie-in space and an intensive direct mail campaign, window streamers, dummy package displays, special posters, broadsides, and elaborate signs on the distributor's trucks.

The advertising began with a half-page display on the morning of October 23. At noon of that day a special luncheon was held under the auspices of the Young Men's Business Club, affiliated with the Chamber of Commerce. The luncheon took place in the Venetian Room of the Hotel Roosevelt; Nordic fish steaks were the feature of the menu. Dr. H. F. Taylor, former chief technologist of the United States Bureau of Fisheries, and recently elected president of the Atlantic Coast Fisheries, spoke on the value of fish as food. His talk was broadcast over station WDSU.

On the dais with Dr. Taylor were three of the four city commissioners, presidents of the leading business and civic organizations of New Orleans, and Mrs. Charles Baxter, president of the New Orleans Federation of Women's Clubs. Mayor T. Semmes Walmsley, of New Orleans, made the opening speech, introducing Dr. Taylor, welcoming him to New Orleans. At the end of the luncheon moving pictures depicting the involved process of producing Nordic fish steaks were shown. Afterwards Dr. Taylor conferred with Louisiana officials interested in food conservation, hospital dieticians, merchants, and teachers and pupils of home economics.

The guests included wives of the club members and as each left she received a package of Nordic hard-chilled fish steaks to take home for Friday dinner.

"We are in New Orleans as a part of a purely experimental campaign," said Mr. Yelton, "but I feel we have tapped the best retail outlets of an excellent market where consumer acceptance on fish is already noteworthy. I am convinced that what has been accomplished in Syracuse will be duplicated in New Orleans."

Don Mills, of M. Mills & Company, New Orleans distributors for Atlantic Coast Fisheries, was highly enthusiastic over the new steak product. Questioned as to the number of retail outlets obtained, the rise of the sales curve, and other similar data, Mr. Rohrs said:

"Like Syracuse, the New Orleans campaign still is in the experimental stage. To give out definite figures at this time would be highly misleading. Later, when the sales curve flattens out and we have definite data on a stabilized turnover, we may be willing to talk."

FRIGIDAIRE FOR MAGNUS MARKETS

Birmingham, Ala.—The Magnus Mutual Markets, a new chain of grocery stores to be operated in Birmingham, have chosen Frigidaire for their equipment. The first four stores were opened recently and additional stores will be established as soon as locations can be secured. The Domestic Electric Company, Birmingham distributors, installed the equipment.

KELVINATOR ON DUTY AT NIGHT CLUB

New Haven, Conn.—Kelvinator Refrigerating Company, 60 Orange Street, has installed a WR 40 multiple unit with four coils in the Beacon Night Club, Savin Rock, West Haven, a shore resort. Highly perishable seafood for shore dinners must be kept on hand at all times. The Kelvinator keeps them safe.

FORTY-TWO FOR APARTMENT

Toledo, Ohio—The Toledo Edison Co., Frigidaire and General Electric representatives, has completed the installation of 42 Frigidaires in the new Rosemary Apartments on Detroit Avenue, Toledo.

FOOD SHOW

In Omaha Sponsored By Retailers

Omaha, Neb.—The Omaha Food Show, sponsored by the grocers and retail meat men of Omaha during the week of October 13 to 18, was used by the refrigerator agencies of the city to display their wares. General Electric, Frigidaire, Kelvinator and Majestic were all on display. Various methods were used to obtain a list of prospects for later sales of equipment.

General Electric, under the management in Omaha of the Storz Electric Refrigeration Co., asked all callers to answer a series of questions as follows:

Name .....
Address .....
Tel. No.....No. in Family.....
Do you use ice?.....What electric refrigerator do you own?.....
Has our special winter purchase plan been explained to you?.....
Firm name and address if your business requires refrigeration.....
Name ..... Address.....
Do you use ice or mechanical refrigeration in your business?.....

And they succeeded in getting 10,000 persons to sign up on the dotted lines. All cards will be filed alphabetically and used later by the city salesmen, with a proper follow-up. General Electric was shown not only in the display of the Storz Electrical Refrigeration Co., but was on duty in the displays of the butter companies, ice cream manufacturers and soft drink exhibits.

The Nebraska Power Co. made a display of Kelvinator and other electric household equipment. The Majestic was seen in public for the first time in Omaha. About 43,000 persons attended the Show.

From the standpoint of the grocers and butchers the display made by the Omaha Fixture & Supply Co., Frigidaire and the Cudahy Packing Co., was ideal. Ofsco furnished one 8 ft. by 6 ft. walk-in box and one of the Model B double-duty display cases, while Frigidaire installed the refrigerating equipment.

Under the direction of a U. S. Government economist, the Cudahy Packing Co. furnished the four quarters of a fine beef carcass and two whole lamb carcasses for the walk-in box, and twenty-three different fancy cuts of beef for display in the case.

The men lined up behind the display are the officers of the Omaha Retail Meat Dealers. The man at the extreme right is Crist Christofferson, president.

Retailers' officials line up behind safe foods

FLORIDA CITRUS

Exchange to Ship Frozen Orange Juice

(Concluded from Page 1, Column 1)

affording an adequate margin of profit to the grower.

"There are pending certain contracts which will dispose of a considerable volume of the juice grade oranges on a similarly satisfactory basis. No market has yet been provided, however, for the balance of that volume of juice grade oranges to be handled for Exchange members.

"It is for the profitable disposal of this remaining balance of Exchange juice grade fruit that the company will concern itself.

"The desirability of removing the lowest 20 to 25 per cent in quality of the orange crop from the boxlot market is readily recognized. In the first place, such fruit during all but exceptionally short crop years rarely brings more than the cost of production, and very often considerably less. To provide a stable and profitable market for this fruit, therefore, is a first and most important consideration.

"There is a second advantage, however, which will be readily recognized by all those who are familiar with fruit and the selling problems connected with it. The ability to load cars at our packing houses, without being forced to include or 'work off' a certain number of boxes of third grade fruit to each car, would be of material advantage in disposing of that car to advantage and without discounts. The presence of third grade fruit in a car containing first and second grades only too often results in discounts on those higher grades.

"Thus, under this plan not only will the Exchange obtain for its third grade oranges a profit to the producer, but will also have a means of obtaining a greater premium (or a less discount) on its first and second grade offerings.

"We will, under this plan, make use of a freezing method which has been developed and commercially proved. Of all the work which has been done in Florida, in California and elsewhere, no other known method of preserving orange juice has worked out satisfactorily to date.

"The Exchange Juice Company will take part of the third grade of oranges, which are not otherwise contracted for at $1 per box under pending contracts, ship them to the facilities, juice the fruit, freeze it and put it into storage. The price on this juice can and will be controlled. We believe that the juice when in storage is not perishable, and can be held indefinitely until a profitable market is open and responsible buyers obtained.

"Facilities now exist in the state which can be used in the operation of this plan. They are readily adaptable to the method of freezing proposed. A survey of such facilities has already been made and they are found to be adequate to care for the volume of fruit contemplated for use under this plan.

"The Florida Citrus Exchange has been carefully investigating a market for orange juice, either in frozen or juice form, over the past 18 months. These investigations have proved beyond a doubt that there is a ready and sizable market for as much as can be put up from the fruit available under these grades.

"In the sale of this juice, we will control the product and the price on that product. In our opinion, the juice can be sold to net the grower $1 per field box for the fruit handled in this manner."

FOURTH

ALTHOUGH the leading producers of quick-frozen meats, especially the big packers, have not given out figures in regard to their volume of production, it is known that some of them at least are shipping constantly increasing quantities of the new foodstuffs. A clue to the channels into which considerable quantities of the quick-frozen meats flow, is provided by the following paragraph from the *New York Times*, which was recently reprinted in the *Meat and Livestock Digest* published each month by the Institute of American Meat Packers.

"One-fourth of all the food manufactured and sold in the United States is consumed in the so-called institution market, made up of restaurants, hotels and other public institutions, according to a survey made by General Foods. Ten years ago this market absorbed but 10 to 15 per cent of the total food production. There are more than 7,000 hospitals in the country, which require $190,000,000 worth of food annually; 17,000,000,000 meals are eaten every year in more than 100,000 restaurants, while more than 15,000 school cafeterias are serving about 6,000,000 meals a day."

Quick-frozen meats and other products sold to this great "institution market" are never seen in the retailer's store. They take a short cut from producer to consumer, that keeps them from public notice.

Production Tools Number

Buyer's Guide Section

In Three Parts Part Three

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, NO. 5, SERIAL NO. 107

DETROIT, MICHIGAN, NOVEMBER 5, 1930

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TWO DOLLARS PER YEAR

Majestic Plants Packed With Machinery

Operations Measured, Controlled In Precise Mathematical Fashion

Chicago, Ill.—Visitors to the manufacturing plants of the Grigsby-Grunow and Majestic Household Utilities companies, where Majestic radios and refrigerators are made, usually leave the final exit as bewildered as they are exhausted.

These factories cover lots of territory, and every inch is utilized for some good purpose. Listening to the different engineers who are in charge of the various plant sections, one hears a confusing yet impressive torrent of figures and decimal fractions. Every operation is measured and controlled, and all the thinking in these plants is done in precise mathematical terms.

One group of buildings is devoted to the making of radio and refrigerator cabinets. Another set makes the radio chassis and the refrigerator cooling unit. And the dominant, portentous note in each group is the moving line of production.

Conveyor Is Keystone

The conveyor is the keystone of the Majestic system. Everywhere, conveyors. Parts of many different kinds are riding hither and yon on hooks attached to traveling chains. Long belts carry other parts. Bigger pieces ride on ball-bearing roller lines, which drive through the buildings in many directions.

Nothing stops moving, albeit there may be motion in several different directions and of several different parts in the same room. Yet there is no confusion, and in the final assembly room all lines converge onto a big roller conveyor which shoots the crated products outside to a loading platform and into freight cars.

Claimed to be the largest and most productive furniture plant in the world, the radio cabinet factory is notable chiefly for its high-speed woodworking machines. One passes through this plant to get into the refrigerator cabinet plant, and having seen the radio factory, one is fully prepared to be impressed by the refrigerator manufacturing processes.

Mighty Punch Presses

Nor is the visitor disappointed. The first sight that meets the gaze is a row of mighty punch presses, which chew up sheets of steel into refrigerator cabinets, liners, legs, and tops with single crunches of their mighty jaws.

The big Toledo punch presses will stamp out three sides of the cabinet at one blow. Other presses punch the back, top, and legs. These clanging monsters leave an impression upon one's mind almost as lasting as the impression they make on the steel fed into them.

From these presses the various conveyor lines begin. The steel parts are bathed, sprayed, heat treated, and sprayed again, constantly on the move, until they emerge into an assembly line and receive trimming and hardware. Units are installed, crates are put on

(Concluded on Page 8, Column 1)

New Portable Electric Devices Announced

Towson, Maryland—The Black and Decker Mfg. Co., of this city, has just announced two new additions to their line of portable electric tools, especially adapted to the construction and installation of electric refrigerators.

Known as the "Universal Twins," these two products, a ball-bearing electric drill and an adjustable clutch electric screw driver, are equipped with a pistol grip and trigger switch like all Black & Decker tools.

FAN AND BLOWER EXPERT GETS APPOINTMENT

Worcester, Mass.—G. H. Bolle has recently been appointed district representative for the New York territory of the Coppus Engineering Corp. of this city, which manufactures blowers and steam turbines.

Mr. Bolle, according to officials of the Coppus organization, has made an especial study of the application of fans and blowers to refrigerator factories.

Titanic

W. C. GRUNOW, president of Majestic Household Utilities Corp., is in complete charge of production for that company, and is the man who planned the titanic new factories in Chicago which are now turning out Majestic refrigerators.

Copeland Engineers Reduce Costs

By F. B. Petteys and Edward Hughes
Copeland Products, Inc.

THERE are two lines of development that must be kept very much alive by any company which expects to meet the keen competition that exists in merchandising today.

The first of these is a constant improvement in quality, and the second is a progressive decrease in the cost of manufacture.

A typical example of how these two conditions have been met is illustrated in the manufacture of the compressor flywheel used by the Copeland Products, Inc., in its condensing unit.

The usual method of manufacture for flywheels has been to start with a casting with the belt groove cored in, and then finish this casting on a series of machines accomplishing the various operations of turning the outside diameter,

(Concluded on Page 4, Column 3)

Tools Needed By Refrigeration Industry

New Companies Enter Field; Older Firms Progressive, Expanding

PRODUCTION tool manufacturers who have smart engineers attached to their organizations will find a ready outlet for the inventive talents of these men in the electric refrigeration industry.

Inasmuch as the building of household food-cooling units is more or less a recent development, the application of machinery to the operations of making electric refrigerators is still a subject of intensive study by the industry.

Tool makers who can help production managers solve the problems incident to efficient line manufacturing systems will be welcomed with the proverbial open arms, and will create for their machines a ready sale.

With this issue of the NEWS two new refrigeration units are announced: the King Cold, made by the Illinois Moulding Co., a newcomer to the field; and the new Servel Hermetic, produced by one of the pioneer organizations in the industry.

In the past few weeks other new electric refrigerators have been introduced, notably the Majestic, which has been placed on the market by the powerful Grigsby-Grunow Co., makers of the Majestic radio.

Rumors of other new refrigerators now in the experimental stage are float-

(Concluded on Page 8, Column 5)

Exploring

Previous Buyer's Guide sections have been devoted to dealer necessities (office equipment, delivery equipment, electric signs), related products (oil burners, radios), and manufacturer's needs (metals, production tools).

The next pink section will invade an entirely new realm, a field which is just now opening up to the refrigeration industry. Devoted to Automatic Retailing, the next Buyer's Guide section will tell the story of refrigerated food vending machines.

Unique

F. P. NEHRBAS, vice-president of Servel, Inc., in charge of production, is largely responsible for the designing and installation of the unique new equipment which his company has recently installed in its Evansville plants to make the Hermetic unit.

Experience Teaches Manufacturers

By P. A. Celander
Chief Engineer, Williams Oil-O-Matic Heating Corp.

ONE of the reasons why the designs of the different parts incorporated in a mechanical refrigerating unit have been developed to the high degree of efficiency to be seen today is that the refrigerating industry has had the experience of a great many other industries to draw from.

As a typical example, the automotive industry can be taken. The high standards which have been set in the automobile manufacturing field are of constant aid to engineers and manufacturers in the refrigeration industry.

The many developments which have come about in metals and other materials and the production processes which have come with these new materials in the automotive field, have in a most im-

(Concluded on Page 4, Column 3)

Speed Essential In New Servel System

Nothing, Not Even Visitor Stops Moving

Evansville, Ind.—"Everything on the move." That's the motto of the plants wherein Servel and Electrolux refrigerators are made.

According to the theories evolved and applied by Vice-President F. P. Nehrbas, nothing in these factories should ever halt for a parade rest. Pauses cost money, he maintains; hence the making of an Electrolux or one of the new Hermetics is a continuous process job.

Thoroughly imbued with this idea is S. R. Cooper, of the Servel organization, and when he conducts one through the vast assemblage of factory buildings that constitute the Servel-Electrolux-Hercules properties, it is done on a non-stop basis which leaves the visitor breathless and sighing for a piece of overstuffed furniture.

Talking in the machine-gun manner made famous by Floyd Gibbons over the radio, the dynamic Mr. Cooper speeds through the various factories, his followers attempting to keep up the pace, and explains the different operations as they are passed en route.

Cabinet Doors

The first job he shows and elucidates is the art and science of making refrigerator cabinet doors. One looks over a stock of handsome ash and maple; one sees the wood shaped, sanded, polished with garnet cloth—all by machines; and one watches the wood frame and the porcelain liner assembled, glued, and stained. The insulation is inserted and sealed with hot hydraline, after which the steel cover is fitted. It is all quite absorbing.

Thousands of Black & Decker electric screw drivers are used in these operations. To the uninitiated these pistol-shaped instruments are as intriguing as the mechanical toys kid brother gets at Yuletide.

Interesting, too, is the Smith drum sander, which uses garnet cloth, and the electrically heated and controlled glue pot.

Spindle Shaper

Before leaving the room the visitor also tries to look twice at the spindle shaper, which is said to be an application of metal working methods to woodworking, and which employs high frequency, 7,000 r. p. m. motors.

After tearing one's eyes from this fascinating machine, one watches the porcelain liners—one-piece steel sheets with welded joints—as they are cleaned, sprayed inside and out with an oil base primer, and baked in a tunnel-type oven.

Following these movements, the liners are secured to frames with hot hydraline (odorless asphalt) and paper. To complete this particular job galvanized iron corner protectors are affixed to prevent the rustless steel tape (which binds the whole) from cutting into the insulation.

After acquiring frames, the steel liners are given finishing coats of lac-

(Concluded on Page 8, Column 3)

Special Pipe Cutter Now On Market

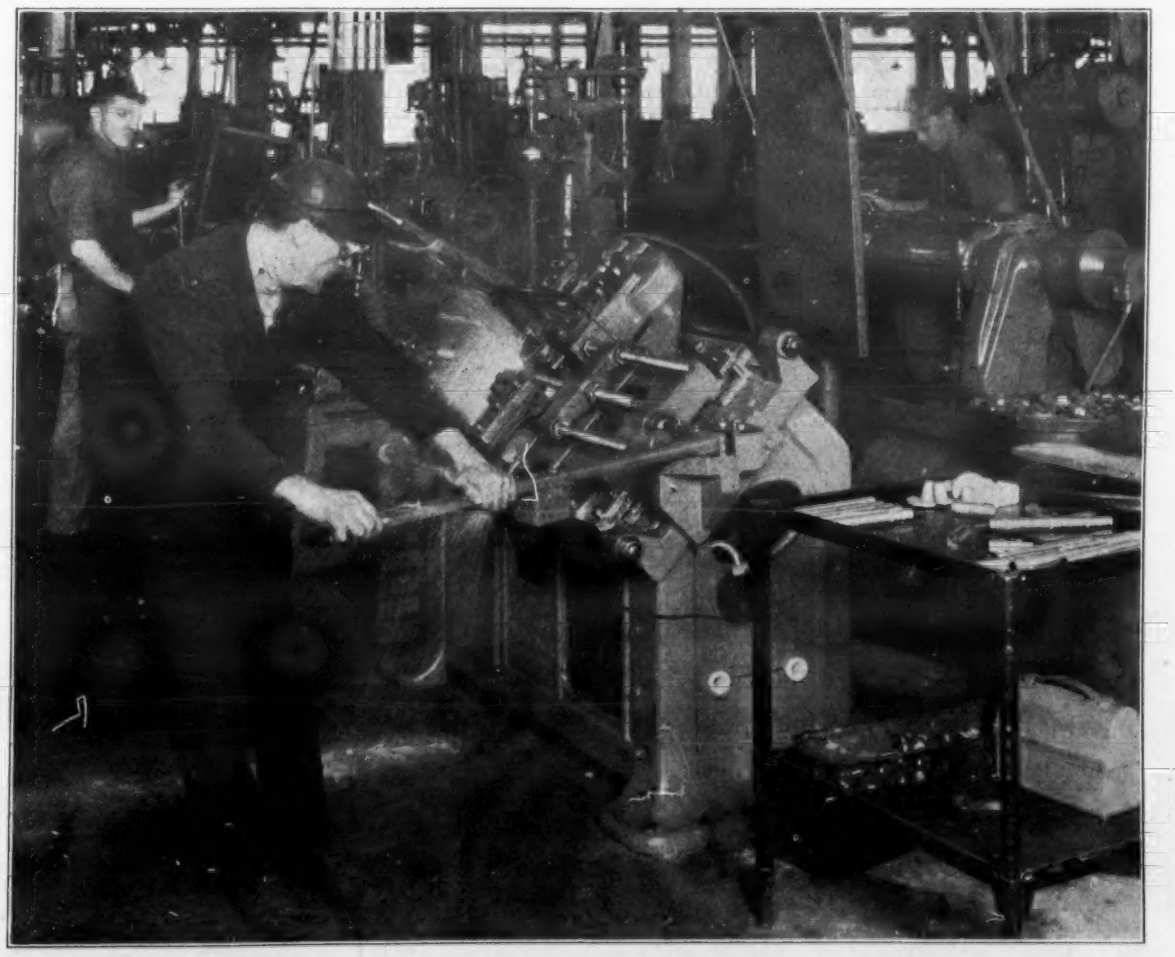
Warren, Ohio — A new "Beaver" square-end pipe cutter, adapted for use in the electric refrigeration industry, is now being marketed by the Borden Co. of this city. This tool is gear-driven, has self-feeding knives and has a driving pinion in front. Nickel steel is used in the main housing and cover plates.

A single wrench is used for centering the tool on the pipe by means of V-blocks; and the same wrench can be used to place the knives under compression. It will cut off four-inch pipe in approximately two and one-half minutes.

HIGH SPEED PIPE THREADER OFFERED BY JARECKI

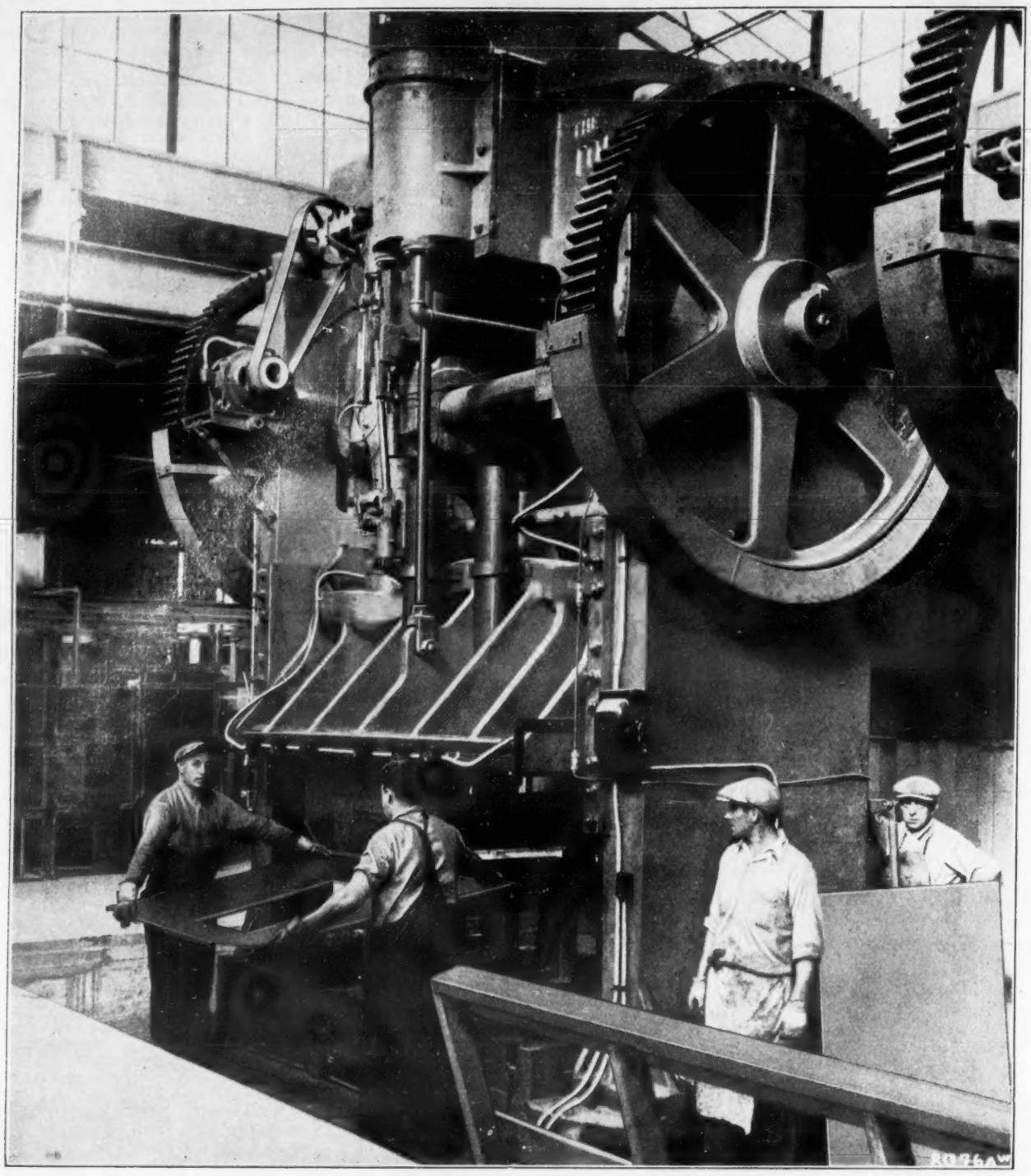
Erie, Pa.—Announcement of a new high-speed pipe threader, designed for use in electric refrigeration factories, has been made recently by the Jarecki Mfg. Co. This threader embodies an automatic self-opening die-head, quick-change steel chasers, and a range of six spindle speeds.

Baptism By Fire



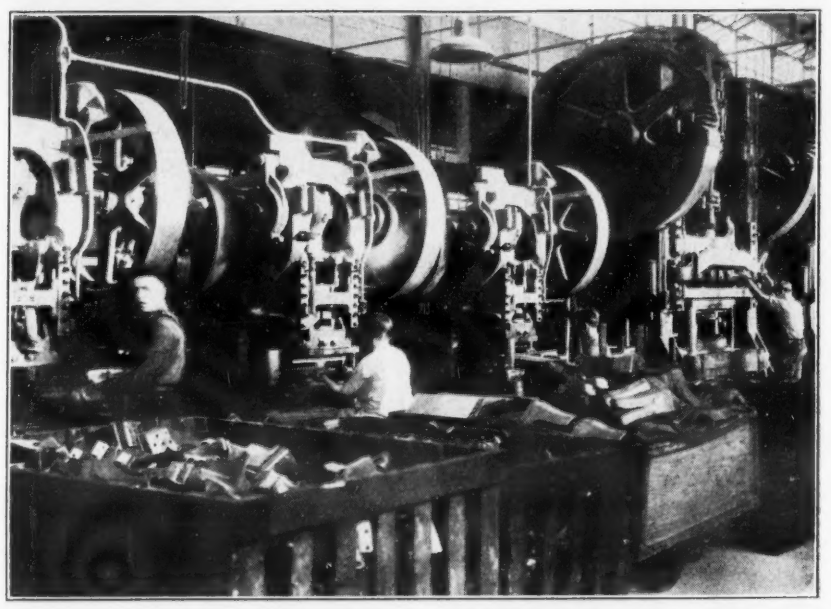
This Servel workman is engulfed in sparks when he operates the butt welder shown above.

Latest Types of Production Equipment are Installed



Mighty punch presses stamp out Majestic refrigerator cabinets. Three sides can be punched at one blow.

The line of heavy duty punch presses shown above is busily at work stamping out food compartments from heavy sheet steel.



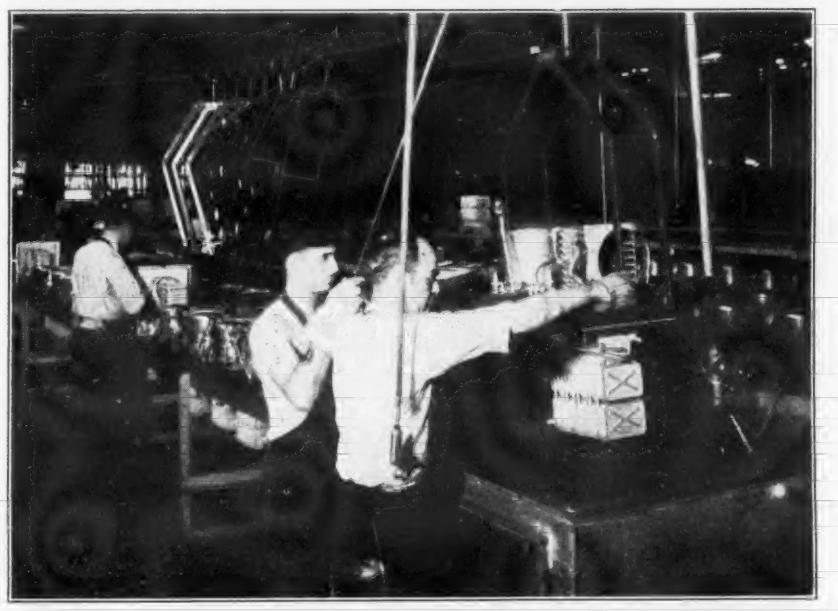
This row of clanking monsters makes legs, tops, and bottoms for the new all-steel Majestic refrigerator. High speeds are attained by these machines.

Electric welding machine which fuses flues to the backs of Majestic cabinets.

Conveyor lines carry the cabinets through heat-treating furnace.

ed in Mammoth New Majestic Refrigerator Factories

Prior to the insertion of ice cube tray containers, absorption coils are welded to the evaporator tank with the hand welding machines shown above.



Completed units—motor, condenser, evaporator, and compressor—are filled with compressed air and immersed in water to test for leaks.

In this room Majestic units are tested for 24 hours. The metered boxes shown are like refrigerator cabinets.

Cabinets emerge from paint-spray booths to receive final retouching.

A complex conveyor system speeds up Majestic production. Above three lines are seen moving simultaneously.

BUYER'S GUIDE SECTION

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Ideas Have Their Inning

WILLIAM WRIGLEY, JR., looks forward to depressions. The man who put chewing gum into the mouths of a nation takes advantage of dull and listless periods by introducing new products and new sales methods to a highly receptive public. New ideas get much better attention when business is poor than when it is booming, claims Mr. Wrigley. During the last slump he brought out P. K.'s. Today the "Cleopatra's Secret" campaign (acquire beautiful lips by chewing Wrigley's) is hitting on all sixteen. And his baseball club, the Chicago Cubs, is undergoing a thorough revamping of personnel.

On neighboring pages of this section will be found pictorial demonstrations of the fact that two other powerful corporations, much closer home than a chewing gum manufacturer, believe thoroughly in the same idea. Servel, Inc., of Evansville, Indiana, is grasping this psychological moment to introduce a new hermetically sealed unit electric refrigerator, a radical departure in design from previous Servel units. To manufacture this machine Servel has spent thousands upon thousands of dollars for new equipment, particularly upon specially designed automatic production tools, during the last few months.

Messrs. Grigsby and Grunow, over whose comet-like rise in the radio industry the business world is still breathless, have also seized upon the opportunity of the day to bring out the Majestic refrigerator. This product required a brand new factory, and a complete outfit of modern equipment, calling for an expenditure running well into the millions.

News comes from the Kelvinator plant that production tools of remarkable efficiency and unique design have just been installed in some departments. Other leaders in the refrigeration industry report the adoption of improved machinery and production equipment.

The acceptance by sagacious officials of the idea that slack periods provide real opportunities for innovations and renovations is not only good psychology but sound business practice as well. Materials can be purchased at rock-bottom prices. Labor is plentiful and cheap. The man who begins erecting a new factory or remodeling an old one becomes a public benefactor. And he finds the public in an attentive mood when he brings out his new model or his improved product, for his enterprise and initiative in spending money and putting men to work while others are sitting tight and clamping time locks on their purses have given him reams of favorable publicity.

Depressions are preëminently times for the man with ideas. When business is booming the fellow who thinks he knows how to do it better is lost in the shuffle. Executives are not often prone to tinker with a system that is apparently successful, and more likely than not they are already overburdened with a rush of business which is more than they can comfortably handle. But when orders slow up and demand for their goods sinks, officials will look twice and sometimes three times at any scheme or device or improvement which promises to help alleviate the situation.

Alert manufacturers of production tools should be particularly fortunate just now. When sales drop off, the inevitable result is that the pruning knife is applied to production costs. Any company which has a new machine which will do old operations more quickly and cheaply has a product for which there is a demand.

Particularly is this true in the refrigeration industry. Production tools used by automotive factories were adapted hastily to the making of units and cabinets when the industry made its big forward movement a few years ago.

Persistently since this time refrigeration engineers have been designing equipment to fit the peculiar needs of their factories. The reconditioned Servel plants, for instance, are chock-full of special machines to be found nowhere else. Being young, and faced with fast-moving competition, electric refrigeration executives are unusually amenable to suggestions of more efficient methods.

Twofold is the opportunity. Production tool makers will find in the refrigeration industry a ready market for machinery designed especially for the needs of the latter. The industry itself is discovering that a depression is the logical time to re-equip plants and present new products.

Industry Is Aided By Experience Of Others

(Concluded from Page 1, Column 4)

portant way contributed to the trend in design of refrigerating units.

A great deal of credit for the success of refrigeration compressors must be given to the organizations which have devoted a great deal of time and large sums of money to research in producing alloy castings.

While it is true that this industry is contributing its share at the present time towards developments in alloys—it must not be forgotten that a great deal of work has been done as a result of other lems before the refrigeration field beindustries concentrating on such probcame as active as it is today.

When design calls for a steel forging, it is today a simple matter to choose the specifications of the material logical for any particular application.

Good Forgings Available

Any good forging producer can furnish forged parts made according to specifications, and the manufacturer can before such a forging is even tested feel reasonably sure that no trouble will arise from its use.

Only secondary in importance to determining proper materials for a refrigerating device is the matter of treating this material during its stages of production.

Present-day science has not only determined what is necessary to do to certain materials to obtain certain specific results, but wide-awake manufacturers have designed equipment with which to do it economically and reliably.

Research which has been done in private laboratories, as well as in educational institutions, provides data which enables an engineering department to know before it starts a job what results can be expected in handling any known refrigerant.

Oil producers have spent time and money in research and developments which guide the manufacturer in his choice of lubricants for his devices.

Acknowledgment

The foregoing has been mentioned as an acknowledgment of what one individual feels is due to industry as a whole in the present day success of refrigerating equipment.

Because of these contributions by industry in general, the problem of making a successful refrigerating unit has resolved itself into that of analyzing what is known in this art, making the best possible use of it, coupling with it one's own experience as an individual manufacturer, choosing a design which seems logical, and finally incorporating features in that design which have not previously been used.

Activity in the field of electrical refrigeration is highly competitive. Any company in the business of making refrigeration equipment knows that it is traveling in fast company.

Only products of recognized merit will have any chance of enjoying profitable business, but with machines properly designed and sound methods of distribution, the demand is great enough for refrigerating devices, and manufacturers should look forward with optimism to the future.

Copeland Lowers Costs On Flywheels

(Concluded from Page 1, Column 2)

facing both sides of the rim and hub, forming the belt groove, and drilling and taper-reaming the shaft hole.

It was found that leaving out the cored belt groove, while it increased somewhat the weight of the rough casting, actually decreased the cost of the casting, as leaving out the core decreased the cost per pound.

A special machine was then tooled up to perform automatically all of the finishing operations which had formerly been made on a series of machines.

Making all of these operations from one set-up has eliminated the errors due to rechucking and has made it possible to hold much lower limits, and has at the same time decreased the time required for the complete finishing to a small fraction of that formerly needed.

By combining these various roughing and finishing operations it has been possible to make this machine fully automatic, except for the chucking, so that the operator has most of his time free for other duties.

In order to utilize this time, the balancing machine, which is of a new type designed by the Copeland organization, has been placed at a convenient point so that the machine operator can balance the finished flywheels as they are completed.

Off Duty in Evansville

By GEORGE F. TAUBENECK

Until quite recently our idea of a man in a woefully painful situation was a conscientious member of an Optimists' Club in these lugubrious days. But we know differently now.

A fortnight ago we arose, weary and aching, from a vibrating Pullman crib in Evansville, Indiana. It was raining. Smoke permeated the muggy atmosphere. The streets were desolate and ugly. Optimism? Good humor? Heh, heh.

At the culmination of a morning devoted to ferreting out information, Paul Jones, Servel's handsome and likeable young advertising manager, pressed an invitation to join him at lunch. And the luncheon, ladeez and gennemun of this vast assemblage, was the regular Thursday meeting of the Evansville Optimists Club.

Not even a Lewis or a Mencken could have scoffed at the genuine and sincere enthusiasm and optimism of that group. All the sticky platitudes one had ever heard about the Silver Lining, the Sunshine of Your Smile, and It's Always Fair Weather, donned the garb of real, living, actuality.

"You'll learn more about Evansville and its spirit by attending this gathering than you would in a week of undirected prowling," said Mr. Jones. Thereupon we looked and listened closely.

Evansville, we learned, was one of those well-favored cities which Babson charts and the like maintain are in the front rank of the nation's prosperity.

The members of this club bear up the statement. It was the first gathering of any kind whatsover which we have attended during the past six months in which something was not said, in mournful numbers, about The Depression.

Instead of the drives for money, clothes, food, and shelter to aid the jobless, which occupy the attention of public-spirited citizens in so many communities, these men were discussing a Boys' Club which they are promoting with particular success.

Boom times find work of this nature in the ascendancy; but the low swings of the pendulum generally push juvenile promotion aside for the more serious business of feeding the hungry and clothing the naked.

Evansville Optimists are spending at least one evening a week with underprivileged, undernourished and underestimated boys, to say nothing of their more fortunate brothers. They play games, tell stories, and enjoy themselves hugely turning time backward in its flight and making themselves children again just for tonight.

The lawyers, doctors, school teachers, merchants, manufacturers, butchers, bakers, and candlestick makers present sang songs and displayed genuine fellowship in a manner that rang true.

Unlike many service clubs, the combination of the hoopla and good-egg spirits was not obnoxious, nor even overdone. The feeling was natural.

Business was good, they liked their friends, and they liked Evansville. Moreover, they were united in a common purpose of improving their community and themselves. Boys' work satisfies the first half of this common purpose. For the second they listened attentively to a bacteriologist from the Mead Johnson (baby foods, marvel of the financial world just now) company, and asked intelligent questions.

Evansville's industrial beehive is indeed surprising to the stray stranger. It is just across the river from Henderson, Kentucky, where begins the easy, graceful, and unhurried living belt. It is not a metropolis. It is in Indiana, which is by and large a state of farmers and home-owners.

Yet it has succeeded in attracting a growing coterie of factories and industries of many descriptions. Evansville definitely belongs to the Machine Age—a luxuriant oasis of factories in the midst of a Sahara of farmlands and general stores.

Just because Evansville is so industriously occupied, however, is no reason to strike it off the map of Indiana. It retains much of the flavor of the Hoosier state, and harbors many of the latter's typical characters.

Politics, for instance, are dreadfully important in Evansville. Street corner conversations are dripping with sagacious observations on the gubernatorial, Senatorial, assessorial, and editorial situations in true tonsorial fashion.

Down in Evansville they know the records of Congressmen and the statistics on elections fully as well as those living upstate in South Bend can quote yardage gained by Savoldi, Brill, Mullins, Carrideo, Schwartz, et al.

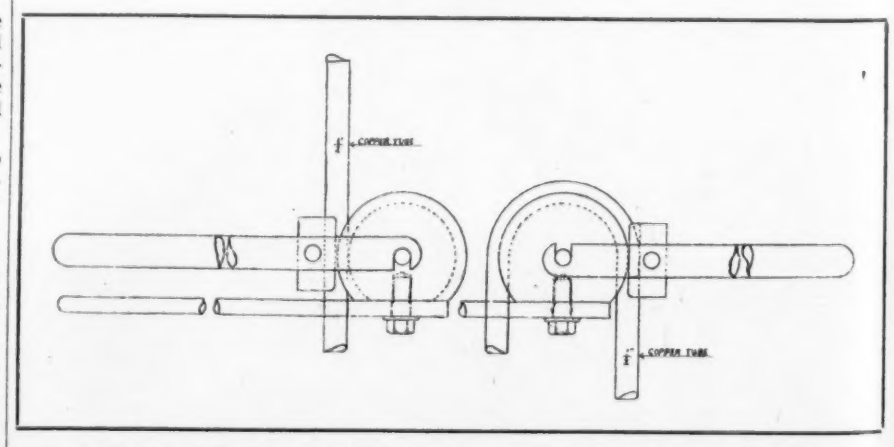
Voting is serious business with them, as it should be with all of us, and every check marked on a ballot represents weeks and even months of earnest discussion, investigation, and argument on the part of many of these people.

Another familiar Hoosier characteristic in Evansville is a small college. An Indiana town without a Siwash or two (enrollment usually under 500) is as unexpected as a bank without a vice-president. Thus it is that Evansville citizens have a college basketball team (Evansville college) to root for, in addition to the customary 57 varieties of high school, amateur, industrial, professional, church, business, and pick-up fives which swarm the myriad floors in every Indiana hamlet, village, town, and city.

Basketball, in case nobody has ever told you, is not a game in Indiana. It is a disease. Furthermore, it is the sine qua non, the raison d'etre, of almost every male youth in the state.

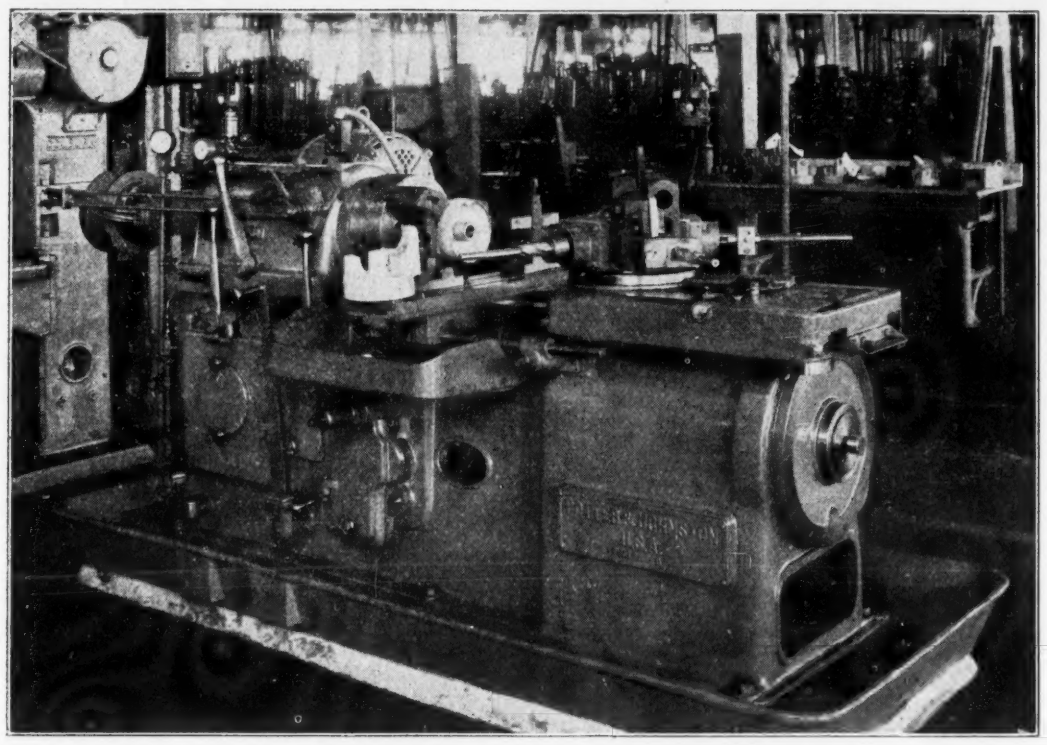
The only Hoosier products which at all compare with basketball (and refrigeration, of course) in importance are pigs, poets, and politicians.

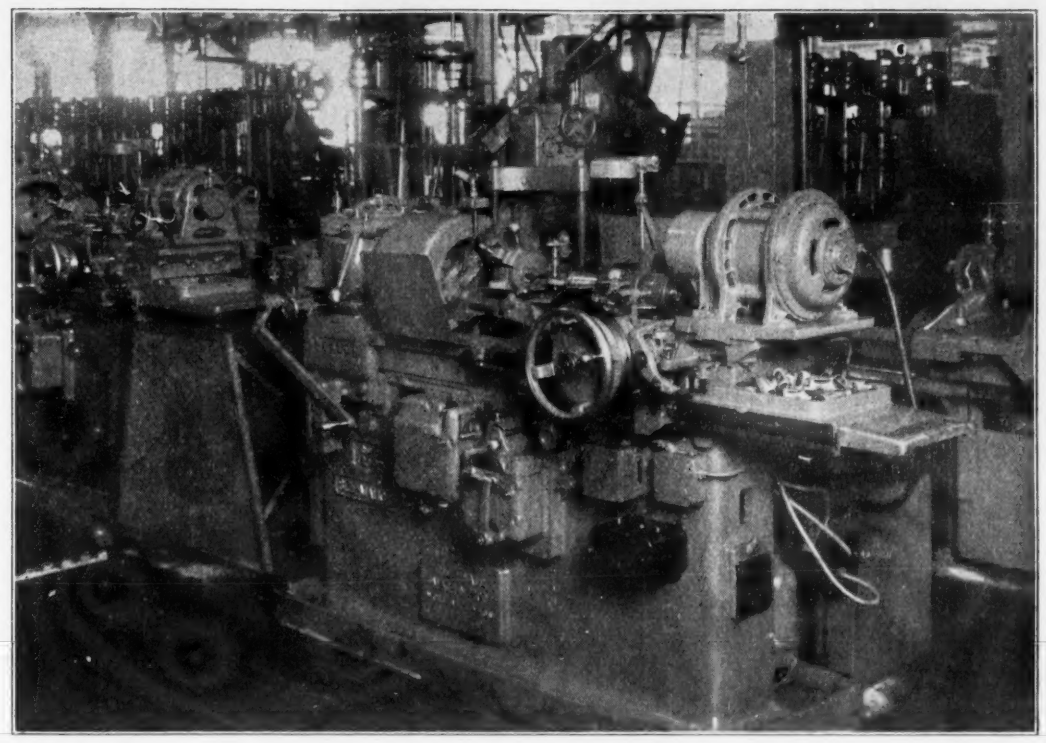
Tube Bender

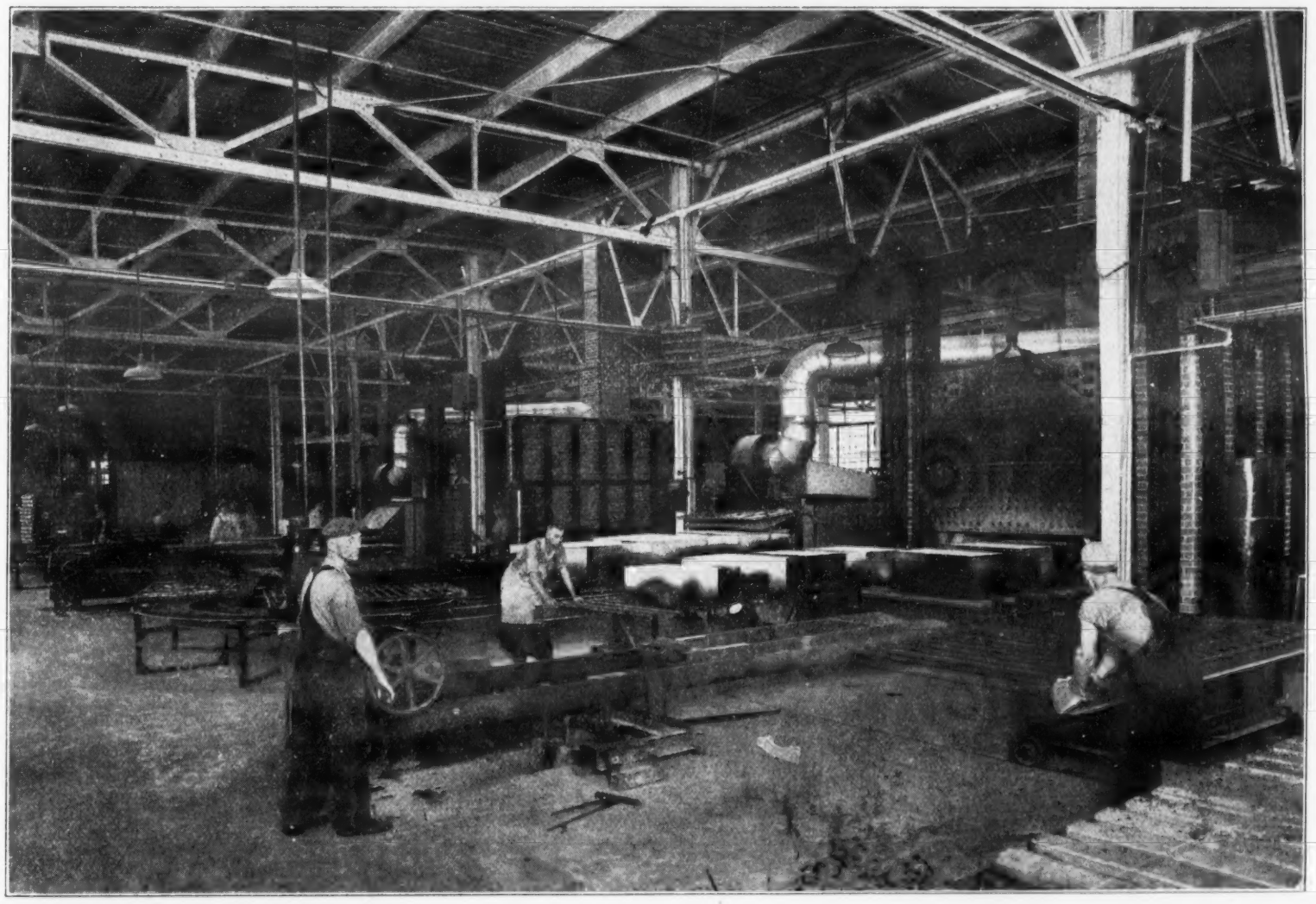


The tube bender shown in the above diagram, made by C. M. Smillie & Co. of Detroit, will make a right angle or "U" bend in any section of a tube without kinking the tubing. The minimum radius which can be bent is 1¼ inches to center of tubing for a ⅜-inch tube, 1½ inches to center of tubing for a ½-inch tube, and 2 inches to center of tubing for a ⅝-inch tube. The ⅜-inch tube bender weighs 2¼ pounds, the ½-inch tube bender weighs 2¾ pounds, and the ⅝-inch tube bender weighs 4½ pounds.

Servel Factory Features Automatic Equipment

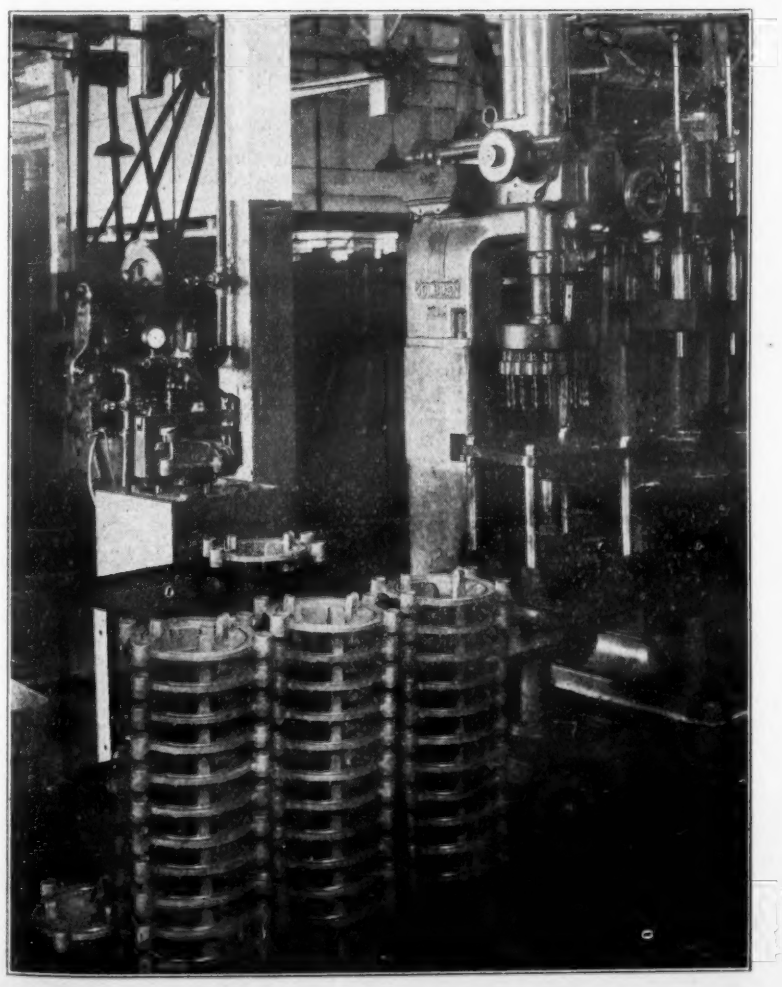






Featured in the new Servel equipment are a number of automatic machines. Above is a Potter and Johnson full automatic chucking machine set up for finishing the main bearings in the compressor base casting. Below is a Colburn drill press which has a special drill head with 18 drills. In the front of this picture is a pile of base castings for the new Hermetic unit, while at the left is a specially designed water-testing fixture.

Another automatic device of which Servel engineers are proud is the Heald automatic internal grinder, pictured above, which is employed for grinding the bore of the cross-head in the new Servel .Hermetic .machine.. In the picture directly below may be seen a honing machine designed by Servel men for imparting a mirror-like finish to the compressor cylinder. A few of these polished cylinders may be noted in the foreground of the picture.

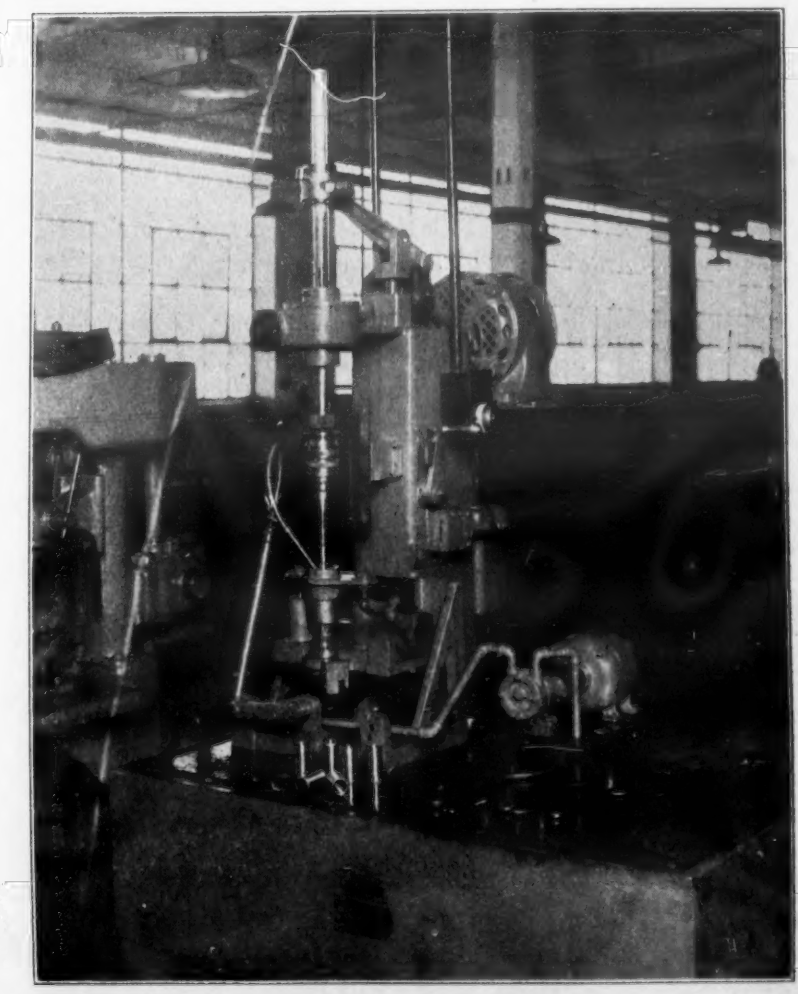


One of the most interesting of the many operations in the newly equipped Servel plant is the heat treatment of food compartments.

The three mammoth furnaces pictured above open huge fiery maws and swallow a row of the steel compartments which are fed into the furnaces on long sliding conveyors.

After their allotted time in the terrific oil heat, a bell rings, the big door of the furnace lifts, and out come the red-hot compartments. Before the door drops again, a new set of the steel cases enter to get a baptism of fire.

Much of the Servel equipment is designed and produced in the company's own plants. One of the largest foundries in the world belongs to this concern, and it is ready at any time to produce tools evolved in the brains of Servel engineers. The result is a factory of unique equipment.



PRODUCTION AND SERVICE TOOLS DIRECTORY

Automatic Machinery

Bradford Machine Tool Co.
(Automatic and Semi-Automatic Lathes)
Cincinnati, Ohio

Brown & Sharpe Mfg. Co.
(Automatic Milling Machines)
Providence. R. I.

Bullard Co.
(Automatic and Semi-Automatic Lathes)
Bridgeport, Conn.

Cincinnati Milling Machine Co.
(Automatic Milling Machines)
Cincinnati, Ohio

Cleveland Automatic Machine Co.
(Automatic Milling Machines)
Cleveland, Ohio

Foster Machine Co.
Elkhart, Ind.

Gisholt Machine Co.
(Automatic and Semi-Automatic Lathes)
Madison, Wis.

Ingersoll Milling Machine Co.
(Automatic Milling Machines)
Rockford, Ill.

Jones & Lamson Machine Co.
(Automatic and Semi-Automatic Lathes)
Springfield, Vt.

Kearney & Trecker Corp.
(Automatic Milling Machines)
Milwaukee, Wis.

R. K. LeBlond Machine Tool Co.
(Automatic and Semi-Automatic Lathes)
Cincinnati, Ohio

National Acme Co.
(Automatic and Semi-Automatic Lathes)
Cleveland, Ohio

Potter & Johnston Machine Co.
(Automatic and Semi-Automatic Lathes)
Pawtucket, R. I.

Reed-Prentice Corp.
(Automatic and Semi-Automatic Lathes)
Worcester, Mass.

Rockford Machine Tool Co.
(Automatic and Semi-Automatic Lathes)
Rockford, Ill.

Seneca Falls Machine Co.
(Automatic and Semi-Automatic Lathes)
Seneca Falls, N. Y.

Sundstrand Machine Tool Co.
(Automatic and Semi-Automatic Lathes)
Rockford, Ill.

Blowers and Dust Collecting Equipment

American Gas Furnace Co.
Elizabeth, N. J.

Buffalo Forge Co.
Buffalo, N. Y.

Chicago Flexible Shaft Co.
Chicago, Ill.

General Electric Co.
Schenectady, N. Y.

Sterling Blower Co.
Hartford, Conn.

Dies and Die Cutters

E. A. Baumbach Mfg. Co.
(Die Making Machines)
Chicago, Ill.

Butterfield & Co. (Div. of Union Twist Drill Co.)
(Forging Dies)
Derby Line, Vt.

City Machine & Tool Works
(Die Sets)
Dayton, Ohio

Danly Machine Specialties, Inc.
(Die Sets)
Chicago, Ill.

Eastern Machine Screw Corp.
(Adjustable & Self Opening Dies)
New Haven, Conn.

Erie Forge Co.
(Die Blocks)
Erie, Pa.

S. I. Errington Mechanical Laboratory
(Adjustable & Self Opening Dies)
New York. N. Y.

Gardener Tap & Die Co.
Marion, Ohio

Geometric Tool Co.
(Adjustable & Self Opening Dies)
New Haven, Conn.

Geo. Gorton Machine Co.
(Die Cutting Machines)
Racine, Wis.

Greenfield Tap & Die Corp
Greenfield, Mass.

Frank Hansen Machine Co.
25 E. Atwater St., Detroit, Mich.

R. G. Haskins Co.
(Die Making Machines)
Chicago, Ill.

Holcomb Steel Co.
(Die Blocks)
Syracuse, N. Y.

Jones & Lamson Machine Co.
(Adjustable & Self Opening Dies)
Springfield, Vt.

Keller Mechanical Engineering Co.
(Die Cutting Machines)
Brooklyn, N. Y.

Kropp Forge Co.
(Die Blocks)
5300 Roosevelt Rd., Chicago, Ill.

Landis Machine Co.
(Adjustable & Self Opening Dies)
Waynesboro, Pa.

Murchey Machine & Tool Co.
(Adjustable & Self Opening Dies)
Detroit, Mich.

National Acme Co.
(Adjustable & Self Opening Dies)
Cleveland, Ohio

National Machinery Co.
(Adjustable & Self Opening Dies)
Tiffin, Ohio.

Noble & Westbrook Mfg. Co.
(Steel Marking Dies)
Hartford, Conn.

Oliver Instrument Co.
(Die Cutting Machines)
Adrian, Mich.

Reed-Prentice Corp.
(Die Making Machines)
Worcester, Mass.

Star Tool & Die Co.
2520 24th St., Detroit, Mich.

U. S. Tool Co.
(Die Sets)
Ampere, N. J.

Winter Brothers Co.
(Dies)
Wrenthen, Mass.

Drill Presses

Acme Diamond Tool Co.
(Diamond Tools)
172 Broadway, New York, N. Y.

T. R. Almond Mfg. Co.
(Micrometers, Drills, Chucks)
Ashburnham, Mass.

American Broach & Machine Co.
(Hydraulic Pumps & Presses, Broaching Machinery)
415 W. Huron Blvd., Ann Arbor, Mich.

B. C. Ames Co.
(Bench Drilling Machines)
Waltham, Mass.

Arbor Press Co.
Evansville, Ind.

Avey Drilling Machine Co.
Cincinnati, Ohio.

Baker Bros.
Toledo, Ohio.

Barnes Drill Co.
(Automatic and Semi-Automatic Drilling Machines)
Rockford, Ill.

W. F. & John Barnes Co.
(Heavy Duty Drilling Machines)
Rockford, Ill.

Bradford Machine Tool Co.
(Automatic and Semi-Automatic Drilling Machines)
Cincinnati, Ohio.

Buckeye Twist Drill Co.
Alliance, Ohio.

Canedy-Otto Mfg. Co.
(Bench Drilling Machines)
Chicago Heights, Ill.

Cincinnati Bickford Tool Co.
(Vertical Drilling Machines)
Cincinnati, Ohio.

Cincinnati Electrical Tool Co.
(Bench Drilling Machines)
Cincinnati, Ohio.

Cincinnati Electrical Tool Co.
(Bench Drilling Machines)
Chicago Heights, Ill.

Jas. Clark, Jr., Electric Co.
(Bench Drilling Machines)
Louisville, Ky.

Conn-Perry Mfg. Co.
4341 Horatio Ave., Detroit, Mich.

Consolidated Machine Tool Corp. of America.
(Heavy Duty Drilling Machines)
Rochester, N. Y.

Detroit Machine Tool Co.
(Automatic and Semi-Automatic Drilling Machines)
Detroit, Mich.

Edlund Machine Co., Inc.
(Drilling Machines & Tapping)
149 Thomas St., Cortland, N. Y.

Elgin Tool Works.
(Bench Drilling Machines)
Elgin, Ill.

Foote-Burt Co.
(Heavy Duty Drilling Machines)
Cleveland, Ohio.

Fox Machine Co.
(Upright Multiple Spindle Drilling Machines)
Jackson, Mich.

Giddings & Lewis Machine Tool Co.
Fond du Lac, Wis.

Grant Mfg. & Machine Co.
(Upright Multiple Spindle Drilling Machines)
Bridgeport, Conn.

Gray Hub Co.
(Upright Multiple Spindle Drilling Machines)
Detroit, Mich.

Greenlee Bros. & Co.
(Upright Multiple Spindle Drilling Machines)
Rockford, Ill.

Henry & Wright Machine Co.
Windsor & Sanford Sts., Hartford, Conn.

Kingsbury Machine Tool Corp.
(Upright Multiple Spindle Drilling Machines)
Keene, N. H.

Leland & Gifford Co.
Worcester, Mass.

Manning, Maxwell & Moore.
(Upright Multiple Spindle Drilling Machines)
New York, N. Y.

Minster Machine Co.
(Heavy Duty Drilling Machines)
Minster, Ohio.

Moline Tool Co.
(Upright Multiple Spindle Drilling Machines)
Moline, Ill.

National Automatic Tool Co.
(Automatic and Semi-Automatic Drilling Machines)
Richmond, Ind.

Oesterlein Machine Co.
(Vertical Drilling Machines)
Cincinnati, Ohio

Oilgear Co.,
(Broaching Machines)
Milwaukee, Wis.

Parker & Harper Mfg. Co.
119 Dewey St., Worcester, Mass.

Perkins Machine & Gear Co.
(Broaching Machines)
Springfield, Mass.

Rockford Drilling Machine Co.
(Automatic and Semi-Automatic Drilling Machines)
Rockford, Ill.

Jos. T. Ryerson & Son
(Heavy Duty Drilling Machines)
Chicago, Ill.

Sundstrand Machine Tool Co.
(Automatic and Semi-Automatic Drilling Machines)
Rockford, Ill.

Weil Machine Co.
(Drills)
2648 E. Fort St., Detroit, Mich.

Grinding Machines

Abrasive Machine Tool Co.
(Die Grinding Machines)
E. Providence, R. I.

Acme Industrial Co.
(Precision Parts, Shafts, Valves, Valve Seats)
415 N. Carpenter St., Chicago, Ill.

American Emery Wheel Works.
(Emery Wheels)
Providence, R. I.

American Machine Tool Co.
(Surface Grinding Machines)
Hackettstown, N. J.

Arter Grinding Machine Co.
Worcester, Mass.

W. E. & John Barnes Co.
(Cutter and Tool Grinding Machines)
Rockford, Ill.

Chas. H. Besley & Co.
(Disc Grinding Machines)
Chicago, Ill.

Bignall & Keller Machine Works.
(Die Grinding Machines)
Edwardsville, Ill.

Blanchard Machine Co.
(Grinders)
62 State St., Cambridge, Mass.

J. G. Blount Co.
(Bench Grinding Machines)
Everett, Mass.

Bridgeport Safety Emery Wheel Co.
1295 W. Broad St., Bridgeport, Conn.

Brown & Sharpe Mfg. Co.
(Arbors and Mandrels)
Providence, R. I.

Bryant Chucking Grinder Co.
Springfield, Vt.

Canton Foundry & Machine Co.
(Cylindrical Grinding Machines)
Canton, Ohio.

Carborundum Co.
(Emery Wheels)
Niagara Falls, N. Y.

Cincinnati Electrical Tool Co.
(Bench Grinding Machines)
Cincinnati, Ohio.

Cincinnati Grinders, Inc.
(Centerless Grinding Machines)
Cincinnati, Ohio.

Cincinnati Milling Machine Co.
(Arbors and Mandrels)
Cincinnati, Ohio.

Jas. Clark, Jr., Electric Co.
Louisville, Ky.

Covel-Hanchett Co.
(Cutter and Tool Grinding Machines)
Big Rapids, Mich.

Cushman Chuck Co.
(Arbors and Mandrels)
Hartford, Conn.

Diamond Machine Co.
(Face or Ring Wheel Grinding Machines)
Providence, R. I.

Gallmeyer & Livingston Co.
(Cutter and Tool Grinding Machines)
Grand Rapids, Mich.

Gardner Machine Co.
Thompson St., Beloit, Wis.

Geometric Tool Co.
(Chaser Grinding Machines)
New Haven, Conn.

Gorton Machine Co.
(Cutter and Tool Grinding Machines)
Racine, Wis.

Haberkorn & Wood.
2208 W. Fort St., Detroit, Mich.

Hanson-Van Winkle Munning Co.
(Surface Grinding Machines)
Matawan, N. J.

R. G. Haskins Co.
(Bench Grinding Machines)
Chicago, Ill.

Heald Machine Co.
Worcester, Mass.

Highland Park Tool Co.
(Die Grinding Machines)
Detroit, Mich.

Hjorth Lathe & Tool Co.
(Internal Grinding Machines)
Boston, Mass.

Hutto Engineering Co.
(Cylinder Grinders)
515 Lycaste, Detroit, Mich.

Landis Machine Co.
Waynesboro, Pa.

R. K. LeBond Machine Tool Co.
(Cutter and Tool Grinding Machines)
Cincinnati, Ohio.

McCrosky Tool Corp.
(Chucks)
1345 Main St., Meadsville, Pa.

Manufacturers' Equipment Co.
(Air Chucks)
5704 W. Fillmore St., Chicago, Ill.

Micro Machine Co.
(Cylinder Grinding Machines)
Bettendorf, Ia.

Murchey Machine & Tool Co.
(Die Grinding Machines)
Detroit, Mich.

National Acme Co.
(Chaser Grinding Machines)
Cleveland, Ohio.

National Broach Co.
11455 Shoemaker Ave., Detroit, Mich.

National Machinery Co.
(Die Grinding Machines)
Tiffin, Ohio.

W. H. Nicholson & Co.
(Arbors and Mandrels)
Wilkes-Barre, Pa.

Norton Co.
(Abrasive Grinders, Lapping Machines)
1 New Bond St., Worcester, Mass.

Oesterlein Machine Co.
(Cutter and Tool Grinding Machines)
Cincinnati, Ohio.

Pittsburgh Grinding Wheel Co.
Rochester, Pa.

Production Tool Co. of America.
(Arbors and Mandrels)
Detroit, Mich.

Rivett Lathe & Grinder Corp.
(Chucking Grinding Machines)
Boston, Mass.

Wm. Sellers & Co.
(Cutter and Tool Grinding Machines)
Philadelphia, Pa.

H. S. Smith Machine Co.
Smithville, N. J.

Sundstrand Machine Tool Co.
(Arbors and Mandrels)
Rockford, Ill.

Taylor & Fenn Co.
(Cutter and Tool Grinding Machines)
Hartford, Conn.

Union Twist Drill Co.
(Arbors and Mandrels)
Athol, Mass.

Van Norman Machine Tool Co.
(Chucking Grinding Machines)
Springfield, Mass.

Waltham Grinding Wheel Co.
Waltham, Mass.

Westcott Chuck Co.
(Arbors and Mandrels)
Oneida, N. Y.

Whitman & Barnes.
(Arbors and Mandrels)
Detroit, Mich.

Wysong & Miles Co.
(Bolt Sanders)
Greensboro, N. C.

Hand Tools

American Swiss File & Tool Co.
(Small Tools Machinists)
Elizabeth, N. J.

Anchor Brass Foundries.
(Copper Hammers)
1431 Church St., Detroit, Mich.

Armstrong Brothers Tool Co.
(Factory Tools)
373 N. Francisco St., Chicago, Ill.

Black Brothers Co., Inc.
(Glueing Equipment)
401-503 Ninth Ave., Mendota, Ill.

Brown & Sharpe Mfg. Co.
(Small Tools Machinists)
Providence, R. I.

Bullard Machine Tool Co.
Brewster St. and Canfield Ave., Bridgeport, Conn.

Butterfield & Co. (Div. of Union Twist Drill Co.)
(Tap Wrenches)
Derby Line, Vt.

S. W. Card Mfg. Co.
(Tap Wrenches)
Mansfield, Ohio.

Century Saw & Tool Works
(Saws, Files)
1567 Church St., Detroit, Mich.

Conn. Valley Mfg. Co.
(Bits)
200 Main St., Centerbrook, Conn.

Eberhard Mfg. Co.
(Clamps, Tools)
2800 Tennyson Rd., Cleveland, Ohio

Haynes Stellite Co.
(Small Tools Machinists)
Kokomo, Ind.

Heady Tool Co.
(Boring Tools)
Bridgeport, Conn.

Imperial Brass Co.
(Tube Cutters, Benders, Flaring and Refacing Tools, Welding Equipment)
565 Racine St., Chicago, Ill.

Kant Slip Plier & Tool Co.
(Pliers)
6036 Wentworth Ave., Chicago, Ill.

Lovejoy Tool Co.
(Boring Tools)
Springfield, Vt.

Lufkin Rule Instrument Co.
Saginaw, Mich.

Midwest Tool & Mfg. Co.
(Reamers, Boring Tools)
2360 W. Jefferson Ave., Detroit, Mich.

Millers Falls Co.
Millers Falls, Mass.

Osborn Mfg. Co.
(Cleaning Brushes)
5401 Hamilton Ave., Cleveland, Ohio.

Production Tool Co. of America
(Boring Tools)
Detroit, Mich.

Thos. Prosser & Son.
(Boring Tools)
New York, N. Y.

Simonds Saw & Steel Co.
Fitchburg, Mass.

J. T. Slocomb Co.
(Small Tools Machinists)
Providence, R. I.

C. M. Smillie Co.
(Tube Cutters, Benders, Flarers)
520 E. Larned St., Detroit, Mich.

Snap-On Tools, Inc.
Kenosha, Wis.

Stanley Rule & Level Plant.
New Britain, Conn.

L. S. Starrett Co.
(Ratchet Wrenches)
Athol, Mass.

Stevens, Walden, Worcester Co.
(Wrenches)
Worcester, Mass.

Treadwell Tool Co.
Greenfield, Mass.

Warren Tool & Forge Co.
412 Griswold St., Warren, Ohio

J. H. Williams & Co.
(Boring Tools)
Buffalo, N. Y.

Wire Brush Co.
(Brushes)
Springfield, Ohio

Wood & Spencer Co.
1930 E. 61st St., Cleveland, Ohio

Finishing Equipment

Abbott Ball Co.
(Burnishing Equipment)
Hartford, Conn.

W. F. & John Barnes Co.
(Polishing and Buffing Machines)
Rockford, Ill.

Binks Mfg. Co.
(Paint Sprayers)
3114 Carroll Ave., Chicago, Ill.

Blanchard Machine Co.
(Polishing and Buffing Machines)
Cambridge, Mass.

J. G. Blount Co.
(Polishing and Buffing Machines)
Everett, Mass.

Bryant Chucking Grinder Co.
(Polishing and Buffing Machines)
Springfield, Vt.

Buhr Machine Co.
(Multiple Heads)
Ann Arbor, Mich.

Chicago Pneumatic Tool Co.
(Polishing and Buffing Machines)
New York, N. Y.

Cincinnati Electrical Tool Co.
(Polishing and Buffing Machines)
Cincinnati, Ohio

DeVilbiss Co.
(Sprayers)
284 Phillips Ave., Toledo, Ohio

Dumore Co.
(Polishing and Buffing Machines)
Racine, Wis.

Eureka Pneumatic Spray Co.
(Paint Spraying)
217 Broadway, New York, N. Y.

Gardner Machine Co.
(Polishing and Buffing Machines)
Beloit, Wis.

General Chromium Co.
(Chromium Platers)
3220 Bellevue, Detroit, Mich.

Geo. A. Gloor Co.
(Drilling Fixtures)
6442 Epworth Blvd., Detroit, Mich.

Hanson-Van Winkle Munning Co.
(Buffing & Polishing Wheels)
Matawan, N. J.

Heald Machine Co.
(Polishing and Buffing Machines)
Worcester, Mass.

Landis Tool Co.
(Polishing and Buffing Machines)
Waynesboro, Pa.

Manning, Maxwell & Moore
(Burnishing Machines)
New York, N. Y.

Metalfuse Process
(Rustproofing)
5320 St. Clair Ave., Cleveland, Ohio

New Britain-Gridley Machine Co.
(Polishing and Buffing Machines)
New Britain, Conn.

Parker Rust Proof Co.
(Rustproofing)
2177 E. Milwaukee Ave., Detroit, Mich.

Rowbottom Machine Co.
(Polishing and Buffing Machines)
Waterbury, Conn.

Standard Electric Tool Co.
(Polishing and Buffing Machines)
Cincinnati, Ohio

Udylite Process Co.
(Cadmium Plating)
3220 Bellevue Ave., Detroit, Mich.

Union Twist Drill Co.
(Polishing and Buffing Machines)
Athol, Mass.

Van Norman Machine Tool Co.
(Polishing and Buffing Machines)
Springfield, Mass.

Lathes

Adriance Machine Works.
(Spinning Lathes)
Brooklyn, N. Y.

American Tool Works Co.
(Engine Lathes)
Cincinnati, Ohio.

Bordon & Oliver Co.
Cleveland, Ohio.

Boye & Emmes Machine Tool Co.
(Engine Lathes)
Cincinnati, Ohio.

Bradford Machine Tool Co.
(Engine Lathes)
Cincinnati, Ohio.

Bullard Co.
(Chucking Machines)
Bridgeport, Conn.

Cleveland Automatic Machine Co.
(Chucking Machines)
Cleveland, Ohio.

Consolidated Machine Tool Corp. of America.
(Engine Lathes)
Rochester, N. Y.

Flather Co.
(Engine Lathes)
Nashua, N. H.

Giddings & Lewis Machine Tool Co.
(Engine Lathes)
Fond du Lac, Wis.

Gisholt Machine Co.
Madison, Wis.

Goss & De Leeuw Machine Co.
(Chucking Machines)
New Britain, Conn.

T. Greaves-Klusman Co.
(Engine Lathes)
Cincinnati, Ohio.

Haynes Stellite Co.
(Lathe Centers)
Kokomo, Ind.

PRODUCTION AND SERVICE TOOLS DIRECTORY

Hendey Machine Co.
Torrington, Conn.
Jones & Lamson Machine Co.
(Chucking Machines)
Springfield, Vt.
R. K. LeBlond Machine Tool Co.
Cincinnati, Ohio.
Lodge & Shipley Machine Tool Co.
(Engine Lathes)
Cincinnati, Ohio.
Manning, Maxwell & Moore, Inc.
(Engine Lathes)
New York, N. Y.
Modern Machine Corp.
(Lathe Centers)
Brooklyn, N. Y.
Monarch Machine Tool Co.
Sidney, Ohio.
D. E. Morand Machinery Co.
6505 Grand River Ave., Detroit, Mich.
Morris Machine Tool Co.
(Engine Lathes)
Cincinnati, Ohio.
National Acme Co.
(Chucking Machines)
Cleveland, Ohio.
New Britain-Gridley Machine Co.
(Chucking Machines)
New Britain, Conn.
Potter & Johnston Machine Co.
(Chucking Machines)
Pawtucket, R. I.
Pratt & Whitney Co.
Hartford, Conn.
Ready Tool Co.
(Lathe Centers)
Bridgeport, Conn.
Reed-Prentice Corp.
(Engine Lathes)
Worcester, Mass.
Jos. T. Ryerson & Son.
(Engine Lathes)
Chicago, Ill.
Seneca Falls Machine Co.
(Engine Lathes)
Seneca Falls, N. Y.
South Bend Lathe Works.
(Engine Lathes)
South Bend, Ind.
Springfield Machine Tool Co.
(Engine Lathes)
Springfield, Ohio.
Sturdimatic Tool Co.
(Lathe Centers)
Detroit, Mich.
Sundstrand Machine Tool Co.
(Engine Lathes)
Rockford, Ill.
Vonneker Co.
Indianapolis, Ind.
Warner & Swasey Co.
(Lathes)
5701 Carnegie St., Cleveland, Ohio.
Whitman & Barnes.
(Lathe Centers)
Detroit, Mich.
Wickes Bros.
(Engine Lathes)
Saginaw, Mich.

Material Handling Equipment

Acme-Detroit Saw Corp.
(Saws)
528 E. Fort St., Detroit, Mich.
Ace Steel Co.
(Handling Equipment)
2832 Archer Ave., Chicago, Ill.
American Engineering Co.
(Electric and Traveling Hoists and Cranes)
Philadelphia, Pa.
Barret-Cravens Co.
(Industrial Trucks)
3256 W. 30th St., Chicago, Ill.
Canton Foundry & Machine Co.
(Portable Hoists)
Canton, Ohio
Canvas Products Corp.
19 E. McWilliams St., Fond du Lac, Wis.
Cleveland Electric Tramrail Div., Cleveland Crane & Eng. Co.
(Conveyors)
Wickliffe, Ohio
Colson Co.
(Dollies)
1309 Athens Ave., Lakewood, Ohio
Detroit Hoist & Machine Co.
(Electrical Hoists)
8201 Marrow, Detroit, Mich.
Dodge Mfg. Corp.
(Elevators and Conveyors)
Mishawaka, Ind.
Fulton Bag & Cotton Mills
Atlanta, Ga.
Harrington Co.
(Electric and Traveling Hoists and Cranes)
Philadelphia, Pa.
Industrial Brown Hoist Corp.
(Hoists)
4403 St. Clair Ave., Cleveland, Ohio
Jeffery Mfg. Co.
(Conveyors)
East 1st Ave., Columbus, Ohio
Lansing Sales Co.
(Padcovers)
170 Harrison Ave., Boston, Mass.
Larmac Co.
Dayton, Ohio
Lowerator Mfg. Co.
112 Pearl St., Brooklyn, N. Y.
Manning, Maxwell & Moore
(Electric and Traveling Hoists and Cranes)
New York, N. Y.
Markwell Mfg. Co.
200 Hudson St., New York, N. Y.
Mechanical Handling Systems, Inc.
(Conveyors)
3454 Denton Ave., Detroit, Mich.
Muvafast Co.
46 Paris St., Newark, N. J.
New Haven Quilt & Pad Co.
80-86 Franklin St., New Haven, Conn.
Samuel Olson & Co.
(Conveyors)
1238 N. Kostner Ave., Chicago, Ill.
Palmer Bee Co.
(Conveyors)
Westminister & G. T. R.R., Detroit, Mich.
Pulmosan Safety Equipment Corp.
(Masks)
176 Johnson St., Brooklyn, N. Y.
Reading Chain & Block Corp.
(Electric Hoists)
Reading, Pa.
E. A. Rice
9050 Alpine, Detroit, Mich.
Service Caster & Truck Co.
(Industrial Trucks)
525 N. Albion St., Albion, Mich.
Shepard-Niles Crane & Hoist Corp.
(Electric Hoists)
388 Schuyler Ave., Montour Falls, N. Y.
Signode Steel Strapping Co.
2600 N. Western Ave., Chicago, Ill.
Standard Conveyor Co.
(Conveyors)
North St. Paul, Minn.
Union Canvas Goods Co.
1016 Hamilton St., Philadelphia, Pa.
Chas. J. Webb & Co.
116 Chestnut St., Philadelphia, Pa.
Jervis B. Webb Co.
(Conveyors)
2921 E. Grand Blvd., Detroit, Mich.
Webster Mfg. Co.
(Conveyors)
1856 Koster Ave., Chicago, Ill.
Yale & Towne Mfg. Co., Stuebing Div.
(Industrial Trucks)
Cincinnati, Ohio
Young Bros.
6500 Mack Ave., Detroit, Mich.

Milling Machines

Barber-Colman Co.
(Milling Cutters)
Rockford, Ill.
W. F. & John Barnes Co.
(Horizontal Boring, Drilling and Milling Machines)
Rockford, Ill.
Brown & Sharpe Mfg. Co.
(Milling Cutters)
Providence, R. I.
Butterfield & Co. (Div. of Union Twist Drill Co.).
(Milling Cutters)
Derby Line, Vt.
Cincinnati Milling Machine Co.
Cincinnati, Ohio.
Consolidated Machine Tool Corp. of America.
(Horizontal Boring, Drilling and Milling Machines)
Rochester, N. Y.
De Vlieg Machine Tool Co.
(Plain Milling Machines)
Jackson, Mich.
R. Y. Ferner Co.
(Vertical Boring, Drilling and Milling Machines)
Washington, D. C.
Geometric Tool Co.
(Milling Cutters)
New Haven, Conn.
Giddings & Lewis Machine Tool Co.
(Horizontal Boring, Drilling and Milling Machines)
Fond du Lac, Wis.
Geo. Gorton Machine Co.
(Universal Milling Machines)
Cincinnati, Ohio
Haynes Stellite Co.
(Milling Cutters)
Kokomo, Ind.
Ingersoll Machine Co.
Rockford, Ill.
Kearney & Trecker Corp.
(Milling Cutters)
Milwaukee, Wis.
Kent-Owens Machine Co.
(Plain Milling Machines)
Toledo, Ohio.
Landis Tool Co.
(Horizontal Boring, Drilling and Milling Machines)
Waynesboro, Pa.
Lovejoy Tool Co.
(Milling Cutters)
Springfield, Vt.
Lucas Machine Tool Co.
(Horizontal Boring, Drilling and Milling Machines)
Cleveland, Ohio.
McMullen Tool & Supply Co.
(Reamers, Milling, Cutters)
1019 Holden Ave., Detroit, Mich.
Manning, Maxwell & Moore, Inc.
(Horizontal Boring, Drilling and Milling Machines)
New York, N. Y.
Michigan Tool Co.
147 Jos. Campau St., Detroit, Mich.
Moline Tool Co.
(Horizontal Boring, Drilling and Milling Machines)
Moline, Ill.
Oesterlein Machine Co.
(Plain Milling Machines)
Cincinnati, Ohio.
O. K. Tool Co.
(Milling Cutters)
Shelton, Conn.
Potter & Johnston Machine Co.
Pawtucket, R. I.
Production Tool Co. of America.
(Milling Cutters)
Detroit, Mich.
Reed-Prentice Corp.
(Universal Milling Machines)
Worcester, Mass.
Rockford Drilling Machine Co.
(Horizontal Boring, Drilling and Milling Machines)
Rockford, Ill.
Jos. T. Ryerson & Son.
(Horizontal Boring, Drilling and Milling Machines)
Chicago, Ill.
Scully-Jones & Co.
(Milling Cutters)
Chicago, Ill.
Wm. Sellers & Co.
(Horizontal Boring, Drilling and Milling Machines)
Philadelphia, Pa.
Siewek Tool Co.
(Vertical Boring, Drilling and Milling Machines)
Detroit, Mich.
Springfield Machine Tool Co.
(Horizontal Boring, Drilling and Milling Machines)
Springfield, Ohio.
Sundstrand Machine Tool Co.
(Continuous Milling Machines)
Rockford, Ill.
Tabor Mfg. Co.
(Milling Cutters)
Philadelphia, Pa.

Ovens and Heat Treating Equipment

Aeroil Burner Co., Inc.
Park Ave. and 13th, W. New York, N. J.
American Electric Furnace Co.
(Heat-treating, Tempering and Annealing Furnaces)
Boston, Mass.
American Gas Furnace Co.
(Heat-treating, Tempering and Annealing Furnaces)
Elizabeth, N. J.
Leon J. Barrett Co.
(Washing and Drying Machines, Metal Parts)
Worcester, Mass.
G. S. Blakeslee & Co.
(Drying Equipment)
19th and 52nd Aves., Chicago, Ill.
Chicago Flexible Shaft Co.
(Heat-treating, Tempering and Annealing Furnaces)
Chicago, Ill.
Colt's Patent Fire Arms Mfg. Co.
(Washing and Drying Machines, Metal Parts)
Hartford, Conn.
Commercial Steel Treating Corp.
6535 Livernois Ave., Detroit, Mich.
Crawford Oven Co.
(Ovens and Sprays)
340 W. Water St., New Haven, Conn.
Crescent Machine Co.
(Industrial Washing Machines)
New Rochelle, N. Y.
Despatch Oven Co.
112-116 First Ave. N., Minneapolis, Minn.
Drying Systems, Inc.
(Drying and Baking Equipment)
1808 Foster Ave., Chicago, Ill.
Economy Engineering Co.
(Heat-treating, Tempering and Annealing Furnaces)
Willoughby, Ohio.
Electric Furnace Co.
(Heat-treating, Tempering and Annealing Furnaces)
Salem, Ohio.
Ferro Enamel Supply Co.
(Ovens and Sprays)
2100 Keith Bldg., Cleveland, Ohio.
General Electric Co.
(Heat-treating, Tempering and Annealing Furnaces)
Schenectady, N. Y.
Grand Rapids Blow Pipe Co.
(Ovens and Sprays)
Grand Rapids, Mich.
Hoskins Mfg. Co.
(Heat-treating, Tempering and Annealing Furnaces)
Detroit, Mich.
Huffman Mfg. Co.
(Gas Furnaces)
310 Davis Ave., Dayton, Ohio.
Johnson Gas Appliance Co.
(Heat-treating, Tempering and Annealing Furnaces)
Cedar Rapids, Iowa.
R. C. Mahon Co.
8650 Mt. Elliott St., Detroit, Mich.
Strong, Carlisle & Hammond Co.
(Heat-treating, Tempering and Annealing Furnaces)
Cleveland, Ohio.
Surface Combustion Co.
(Gas Furnace)
117 Liberty St., New York, N. Y.

Pipe Threaders

Bignall & Keeler Machine Works.
Edwardsville, Ill.
Jarecki Manufacturing Co.
Erie, Pa.
Landis Machine Co.
Waynesboro, Pa.
Merrell Mfg. Co.
Toledo, Ohio.
Murchey Machine & Tool Co.
Detroit, Mich.
Oster Mfg. Co.
Cleveland, Ohio.

Portable Electric Tools

Black & Decker
(Portable Electric and Pneumatic Drills)
Towson, Md.
Chicago Pneumatic Tool Co.
(Portable Electric and Pneumatic Grinding Machines)
New York, N. Y.
Cincinnati Electrical Tool Co.
(Portable Electric Polishing and Buffing Machines)
Cincinnati, Ohio
Jas. Clark, Jr., Electric Co.
(Portable Electric and Pneumatic Grinding Machines)
Louisville, Ky.
Dumore Co.
(Portable Electric and Pneumatic Grinding Machines)
Racine, Wis.
Goodell Pratt Co.
(Precision Tools)
Greenfield, Mass.
R. G. Haskins Co.
(Portable Electric and Pneumatic Grinding Machines)
Chicago, Ill.
Independent Pneumatic Co.
Aurora, Ill.
Mall Tool Co.
(Portable Electric and Pneumatic Grinding Machines)
Chicago, Ill.
Mummert-Dixon Co.
(Portable Electric and Pneumatic Grinding Machines)
Hanover, Pa.
Rotor Air Tool Co.
(Portable Electric and Pneumatic Grinding Machines)
Cleveland, Ohio
Standard Electric Tool Co.
(Portable Electric and Pneumatic Grinding Machines)
Cincinnati, Ohio
Van Dorn Electric Tool Co.
3000 Woodhill Rd., Cleveland, Ohio
S. S. White Dental Mfg. Co.
(Portable Electric and Pneumatic Grinding Machines)
New York, N. Y.

Punch Presses

Adriance Machine Works
Brooklyn, N. Y.
W. F. & John Barnes Co.
Rockford, Ill.
E. W. Bliss Co.
53rd and Second Ave., Brooklyn, N. Y.
Cincinnati Shaper Co.
Cincinnati, Ohio.
Cleveland Tool & Machine Co.
Cleveland, Ohio.
Electric Welding Machine Co.
1531 E. Larned St., Detroit, Mich.
Ferracute Machine Co.
Bridgeton, N. J.
Fox Machine Co., Inc.
(Metal Working Machinery and Presses)
Jackson, Mich.
Henry & Wright Mfg. Co.
Hartford, Conn.
Marshalltown Mfg. Co.
Marshalltown, Iowa.
Niagara Machine & Tool Co.
Buffalo, N. Y.
Oilgear Co.
Milwaukee, Wis.
Peck, Stow & Wilcox.
Southington, Conn.
Rockford Iron Works.
Rockford, Ill.
Rowbottom Machine Co.
Waterbury, Conn.
Toledo Machine & Tool Co.
Toledo, Ohio.
V. & O. Press Co.
Hudson, N. Y.
Zeh & Hahnemann Co.
Newark, N. J.

Testing and Measuring Instruments

B. C. Ames Co.
(Dial Gages)
Waltham, Mass.
John Bath & Co.
(Plug and Ring Gages)
Worcester, Mass.
Bristol Co.
(Testing Instruments)
Waterbury, Conn.
Brown Instrument Co.
(Recording Gages)
Philadelphia, Pa.
Brown & Sharpe Mfg. Co.
(Plug and Ring Gages)
Providence, R. I.
Cramp Mfg. Co.
(Micrometers)
2850 Fulton St., Chicago, Ill.
Federal Gauge Co.
564 W. Adams, Chicago, Ill.
Federal Products Corp.
(Comparator Gages)
Providence, R. I.
R. Y. Ferner Co.
(Measuring Instruments)
Washington, D. C.
Foxboro Co., Inc.
(Electric Meters)
Neponset Ave., Foxboro, Mass.
Gray Hub Co.
(Standard Gages)
Detroit, Mich.
Hanson Whitney Machine Co.
(Plug and Ring Gages)
Hartford, Conn.
Haynes Stellite Co.
(Plug and Ring Gages)
Kokomo, Ind.
Jos. W. Hays Corp.
(Combustion Testing Instruments)
Michigan City, Ind.
Jones & Lamson Machine Co.
(Comparator Gages)
Springfield, Vt.
Henry A. Lowe.
(Dial Gages)
Cleveland, Ohio.
Lufkin Rule Instrument Co.
Saginaw, Mich.
Norma-Hoffman Bearings Corp.
(Measuring Instruments)
Stamford, Conn.
Scientific Instrument Co.
535 W. Larned St., Detroit, Mich.
Sheffield Machine & Tool Co.
Dayton, Ohio.
J. T. Slocomb Co.
(Snap, Thread and Cylindrical Gages)
Providence, R. I.
Standard Gage Co., Inc.
(Dial Gages)
Poughkeepsie, N. Y.
L. S. Starrett Co.
(Dial Gages)
Athol, Mass.
C. J. Tagliabue Mfg. Co.
(Controls, Testing Instruments)
Park and Nostrand, Brooklyn, N. Y.
Carl Zeiss (Geo. Scherr Co.).
(Measuring Instruments)
New York, N. Y.

Time-keeping, Controlling and Recording Equipment

Brown Instrument Co.
(Temperature Controllers)
Philadelphia, Pa.
Carroll Glass Instrument Co.
(Thermometers)
Lansdowne Ave. at 70th St.,
Philadelphia, Pa.
Cutler-Hammer.
(Electric Controllers and Starters)
Milwaukee, Wis.
Fucoma Co.
(Thermometers)
216 Water St., New York, N. Y.
General Electric Co.
(Electric Controllers and Starters)
Schenectady, N. Y.
W. G. Loveday Co.
(Metallic Thermometers)
Salem, Mass.
Moto Meter Gauge & Equipment Corp.
(Industrial Thermometers)
17 Wilbur Ave., Long Island City, N. Y.
Philadelphia Thermometer Co.
915 Filbert St., Philadelphia, Pa.
Precision Thermometer Co.
(Thermometers)
1435 Brandywine St., Philadelphia, Pa.
Service Recorder Co.
(Motor Recorder)
Hanna Bldg., Cleveland, Ohio.
Shepard Niles Crane & Hoist Corp.
(Electric Switches and Controllers)
Montour Falls, N. Y.
Standard Thermometer Co.
(Indicating Dial Thermometers)
66 Shirley St., Roxbury, Mass.
Taylor Instrument Companies
(Temperature Indicating, Recording and Controlling Instruments)
Rochester, N. Y.
Square D. Co.
(Controls, Safety Switches)
6060 Rivard St., Detroit, Mich.
Tork Clocks, Inc.
(Clocks)
12 E. 41st St., New York, N. Y.
Weston Electrical Instrument Co.
(Recording Instruments)
Newark, N. J.
Wilson-Maculen Co.
(Automatic Temperature Controllers)
New York, N. Y.

Welding Equipment

Burdett Oxygen & Hydrogen Co.
(Acetylene Welding)
Chicago, Ill.
Co-operative Arc Welding Co.
(Electric Welding Machines)
Cleveland, Ohio
Federal Machine & Welder Co.
(Electric Welding Machines)
Dana Ave., Warren, Ohio
General Electric Co.
(Electric Welding Machines)
Schenectady, N. Y.
Lincoln Electric Co.
(Arc Welding Motors)
12818 Coit St., Cleveland, Ohio
Oxweld Acetylene Co., Div. of Union Carbide & Carbon Corp.
(Acetylene Welding)
30 E. 42nd St., New York, N. Y.
Prest-O-Lite Co., Inc.
(Acetylene Gas)
7301 Clayton, Detroit, Mich.
Swift Electric Welder Co.
(Butt Welding Machines)
Detroit, Mich.
Taylor-Winfield Corp.
(Electric Welding Machines)
1052 Mahoning Ave., N. W. Warren, Ohio
Thomson-Gibb Electric Welding Co.
(Electric Welding Machines)
Bay City, Mich.
Union Carbide & Carbon Corp.
(Oxyacetylene Welding Machines)
New York, N. Y.
Welded Products Corp.
(Electric Welding Machines)
Kansas City, Mo.
Weldit Acetylene Co.
(Acetylene Welding)
638 Bagley, St., Detroit, Mich.
Wilson Welder & Metals Co.
(Electric Welding Machines)
North Bergen, N. J.